

ARCHIVES OF OTOTOLOGY.

REPORT OF THE FIFTH MEETING OF THE GERMAN OTOTOLOGICAL SOCIETY AT NÜRNBERG ON MAY 22 and 23, 1896.

BY DR. E. BLOCH, FREIBURG-IM-BR.

Translated by Dr. ARNOLD H. KNAPP, New York.

FIRST SESSION, MAY 22D.

1. Report on the Present Standing of the Tests for Hearing.

(a.) Dr. DENNERT, Berlin : **General Part.**—The opinions on the function of the semicircular canals still diverge and it is not settled whether musical sounds and noises are perceived by the same organ. D. thinks that there is no essential difference between the two and that one end-organ is sufficient. In tests for hearing, we have to take into account not only the pitch and intensity of sound but also its duration, especially in the upper octaves.

As the results of tests by bone-conduction are rather uncertain, it is better to endeavor to improve our diagnostic methods of tests by air-conduction, which have not yet become sufficiently precise and objective. The utility of the voice as mode of examination is universally accepted; the examination with the tuning-forks is supplementary.

(b.) Prof. BEZOLD, Munich : **Special Part.**—The tests for hearing should be so simple that every physician could apply them. The tests with the voice and the tuning-forks suffice. In tests with the whispering-voice Bezold principally makes use of numbers. Of the methods with tuning-forks the tests of Rinné, Weber, and Schwabach, appear essential to him. Bone-conduction must therefore be examined, and is normally good in old people. As high sounds are transmitted directly from the air to bone, bone-conduction can best be tested with the A and a' fork. The

former sounds very long, longer than the vibrations can be felt. He likes to use the latter in Weber's test. This test is occasionally of great value in acute affections. An extension of the disease to the labyrinth can be recognized when D. V. is suddenly transmitted to the sound instead of to the affected side. The negative Rinné is so regularly observed in simple diseases of the middle ear beginning with the rupture of the drum, that we may consider a similar result in the so-called scleroses to depend upon similar disturbances of the sound-transmitting apparatus. It is well known that in these cases there is an interference with the mobility of the base of the stapes. In all these diseases there is a limitation of the lower end of the scale, consequently we may assume that the transmission of the lower sounds is normally performed by the chain of ossicles, which is not at all necessary for the highest sounds. This is evident in destruction of the transmission. In middle-ear affections, air-conduction for deep sounds is reduced compared to bone-conduction; in scleroses, however, the high sounds suffer also. Defects at the upper end of the scale are not of very great aid in diagnosis; but when joined to shortening of Schwabach's test, a nervous affection can be supposed. The various methods in general must agree in a given case to be of most value.

In the determination of one-sided deafness we can only test up to c^2 by air-conduction as higher sounds reach the other ear through the air.

Discussed by Drs. PANSE, DENNERT, KESSEL, SCHWABACH, BLOCH, BERTHOLD, SCHEIBE, WEIL, BEZOLD.

SECOND SESSION, MAY 22D.

2. Dr. BLOCH, Freiburg: **On the Carotid Sinus.**—The carotid sinus is the plexus of veins surrounding the internal carotid in the carotid canal of the temporal bone, which was discovered by Rektoržik in 1858. Rüdinger has found its lumen to be equal to that of the artery which it surrounds. Diastolic and systolic movements are thus allowed and at the same time the artery favors the blood current in the sinus. The topographical relation between the carotid and the sinus permits an equalization of the circulation in the brain and the neighboring organs of sense. Similar conditions are to be seen in the case of the vertebral artery and in general in all the arteries which lie in the bony canals.

(Rektoržik, Langer). The author then related a case of hemorrhage from the carotid sinus which occurred during an operation on the mastoid. The patient died fourteen months later of hemorrhage from the carotid. The specimen was then demonstrated.

3. Prof. BEZOLD demonstrated the **Improved Continuous Scale** which now consists of ten tuning-forks, two organ pipes, and an ingenious new Galton's whistle. Price, one hundred dollars, without case.

4. Dr. DENKER, Hagen : **Communication on the Physiological Upper and Lower Sound Limits.** A statistical examination, extending over one and a half years, of 1250 school children whose age was thirteen years and over ; 956 ears heard whispering-voice in more than 15 m. The lower sound limit was, as a rule, at 15 v. d.

Discussed by Drs. KESSEL, BEZOLD.

5. Dr. BÜRKNER, Göttingen, presented a **Specimen of Malformation of the Ear.**

Discussed by Drs. SCHEIBE, BEZOLD, HARTMANN, KESSEL.

6. Prof. SIEBENMANN, Basel : **The Central Acoustic Tract and its Destruction by Tumors of the Corpora Quadrigemina.**

7. Dr. ANTON, Prag : **Tumors of the Eighth Nerve. Report of Two Cases.**

A fifty-five-year-old man, with headache, transient obscuration of visual field, pupils dilated and immobile, and optic neuritis. Tinnitus, right drumhead retracted, hearing could not be tested because of stuporous condition of patient. Watch : L, o ; R, contact. A tumor as large as the fist, a fibro-sarcoma, was found between pons and cerebellum. On the left side the nerve-exits were free, on the right the Vth, VIIth, and VIIIth nerves passed under the tumor, to which the facial and auditory nerves were firmly adherent.

The second case was that of an unexpected condition at autopsy of a laborer, aged sixty-eight. A tumor, the size of a nut, also a fibro-sarcoma was found adherent to the left auditory nerve, possibly originating from the neural sheath, extending to the porus acusticus, and which had caused an atrophy of the auditory and facial nerves.

8. Dr. MANASSE, Strassburg : **Demonstration of Pathological Specimens.**—A solitary tubercle on the VIIIth nerve in the case of a consumptive. The growth was situated to the left of

the pons. The facial and auditory nerves were imbedded in the cheesy mass and could not be isolated.

The author also reported on (1) a tumor of the cochlea which proved to be an endothelioma of cribriform structure arising from the endothelium of the lymphatic vessels, and (2) a carcinoma of the ear.

9. Dr. LEUTERT, Halle: **Bacteriological Examination in Suppurative Middle-Ear Disease.**—The author examined the pus of acute empyemata of the mastoid process after the usual method and with inoculation of animals. In accordance with Bardoni-Uffreduzzi and Gradenigo, he found the pneumococcus (Fränkel-Weichselbaum) to be less virulent than in pneumonia. Of 41 cases Leutert found streptococci alone in 19, staphylococci alone in 2, tubercle bacilli in 2, pneumococci in 9, uncertain in 3. Of the cases in which streptococci and staphylococci were found, the suppuration in the tympanic cavity continued, but had ceased in most of the cases containing pneumococci. With the latter, epidural abscesses occurred more frequently than with other germs. This difference in the clinical course is not absolute, since an infection by streptococci may be very similar. Leutert, however, thinks that a relatively rapid course of purulent otitis media, a more frequent complication with affections of the mastoid process and cranial cavity, and a temporary latency in the mastoid process occur frequently with pneumococci, rarely with streptococci. This agrees with the observations of Zaufal. If pneumococci are found in the middle ear or in the mastoid process at the operation, complications may be expected, *i.e.*, in the latter an epidural abscess may be looked for by exposing the dura mater at the tegmen tympani, which is a perfectly harmless procedure.

10. Dr. HARTMANN, Berlin: **The Changes in the Bony Auditory Canal in Deformed Skulls.**—The author showed a number of skulls and photographs illustrating his paper. Dr. v. Luschan found in 70 to 80 per cent. of the deformed skulls he had obtained from Peru, defects in the tympanic bone varying in size from a pinhole to the size of a lentil; not unusual was the almost total absence of the tympanic bone, as was demonstrated in these skulls and photographs. Virchow in addition had found a flattening and stenosis of the bony auditory canal in 42.4 per cent. of the skulls.

The author from his examination has arranged the changes in the form of the auditory canal in the following groups:

1. The anterior wall is uniformly depressed, flattened. The lumen has a contracted diameter ; the oval shape is replaced by a fissure.

2. The anterior wall is insufficiently developed and the lumen is generally contracted.

3. The anterior wall is sunken in its upper part, in the lower it is bellied out, thus giving the outer margin an S shape.

The occurrence of the defects in the tympanic bone and changes in form of the auditory canal can be explained by pressure on the tympanic bone during the process of deformation, which impedes and disturbs its development.

The changes are often unsymmetrical, which proves that they are not congenital but acquired.

THIRD SESSION, MAY 23D.

11. Dr. SCHUBERT, Nürnberg : **Demonstration of Pathological Specimens.**—Another case of brain abscess in the left temporal lobe was exhibited, in which spasms in the opposite side had been present ; also a case of abscess in the occipital lobe, which had caused no symptoms in a patient suffering from bronchiectasis.

12. Dr. KUHN, Strassburg : **Two Cases of Sarcoma of the Ear.**—A medullary and a melanotic sarcoma. The first occurred in a man, thirty-three years old, who exhibited signs of general sarcomatosis. After a fall there was otorrhœa with gradually increasing deafness, loss of teeth, large tumor at mastoid process extending to base of skull and to dura, which, however, was not damaged. Later, he had diabetes insipidus, and, without especial injury, fracture of the right, and later of the left, femur. No autopsy.

The melanotic sarcoma occurred in a woman forty-four years old, who was anæmic but free from ear trouble. Two years previously, there was a small tumor in the auditory canal, purulent discharge, diminution of hearing. The surrounding glands, and especially those in front of the ear were enlarged. The excision of a small part confirmed the diagnosis. The tumor now extends into the tympanum.

Discussed by Drs. JOËL, KÜMMEL, BERTHOLD, SCHUBERT, DENKER.

13. Dr. KÜMMEL, Breslau : **Ear Disease in Pseudoleukemia (multiple lymphosarcomatosis).**—Report of the case of a man, forty-

six years old, with a tumor of the left tonsil as large as a hen's egg, which was ulcerated inferiorly though without fetor or dysphagia. The glands of the neck were involved. The tumor disappeared after treatment with arsenic; repeated examination of the blood showed no pathological change. After a certain length of time of good health, both sides of the neck again became swollen, the face was bloated, pale, exophthalmus and hemorrhages under the conjunctiva took place. Dysphagia, marked dyspnœa, and stridor. The left tonsil was enormously enlarged, the nasal mucous membrane was swollen, spleen, liver, and inguinal glands enlarged. There was some deafness and on both sides hæmatotympanum. The blood showed the signs of leukæmia—1 : 20 instead of 1 : 358. At autopsy a hemorrhagic exudate was found in the attic enveloping the malleus and incus. In various parts of the body leukæmic tumors were present.

Discussed by SCHWABACH, NAGER, KÜMMEL.

14. Prof. KÖRNER, Rostock : **Operation for the Acquired Occlusion of Auditory Canal.**—Otorrhœa and cicatricial contraction of the auditory canal down to a narrow fistulous tract resulted from a blow of a horse's hoof. Flaps were taken from the posterior wall of the meatus, after some bone of the mastoid process had been chiselled away; firm dressing and recovery in three weeks.

Discussed by Drs. LEUTERT, WAGENHÄUSER, NOLTENIUS.

15. Dr. SCHEIBE, Munich : **Opening of the Mastoid Cells under Local Anæsthesia.**—The author has operated on a case with degeneration of the heart-muscle and diabetes, using chloride of ethyl as a local anæsthetic; the antrum and an extradural abscess in the posterior cerebral fossa were exposed without causing any pain. In six additional cases, of which five were acute, he was forced to resort to general anæsthesia in only one. The author thinks that local anæsthesia can be employed in cases where no tenderness exists over the mastoid and the posterior wall of the meatus is intact. A hypodermatic injection of morphine can be given before. At the drumhead chloride of ethyl has been of no value.

Discussed by Drs. KÜMMEL, HOFFMANN, BEZOLD, BLOCH, THIES, HARTMANN, PANSE.

16. Dr. HARTMANN, Berlin : **A Case of Dysbasia Hysterica Combined with Otalgia Hysterica.**—The patient, thirteen years old, had suffered with a right acute otitis two years ago.

Mastoidotomy was performed six months later on account of very severe pain; the pain then ceased. Last year patient was again taken ill with pain in the ear and fever; after paracentesis no fluid escaped. In addition, patient was unable to walk, and on attempting to do so, he would stagger and require to be led. The drumhead showed no inflammatory changes, the hearing was normal. Pulse and temperature normal. Great pain during the night. When the patient was asked to sit up in bed, he did it quickly and without vertigo. In standing up patient staggered in all directions. No other disturbances of innervation or sensibility were present. After four applications of electricity the pain and disturbance of gait disappeared. This agrees with a group of symptoms which Blocq calls *astasia* and *abasia*. When the disturbances are of minor degree, Oppenheim has named the affection *dysbasia*.

The hysterical character was assured by the rapid recovery. It is probable that the otalgia of the previous year, which necessitated a mastoid operation, was also hysterical.

17. DR. SCHMIDT, Leipzig: **Nasal Obstruction due to Chronic Hypertrophy of the Mucous Membrane.**—Author is opposed to galvano-cauterization and has abandoned it as wearisome or the effect is accompanied by too great a reaction. He prefers glacial acetic acid or chromic acid. On the septum he chooses the bloody operation and in marked swelling of the lower turbinate removes the bone with a saw. The after treatment consists of irrigation with salt water.

Discussed by Drs. HOFFMANN, HARTMANN, BLOCH, KUHN, NOLTENIUS.

18. Prof. WALB, Bonn: **Demonstration of a Self-Acting Pressure Probe.**—This instrument is set in motion by a storage battery. The switch must not be attached directly to the instrument as it would annoy the patient.

It is best to commence the treatment with the hand probe before going over to the more powerful instrument. Author could let it act no longer than two minutes.

Discussed by Drs. BERTHOLD, WALL, STIMMEL.

19. Dr. KÜMMEL showed a **Rubber Stamp** for diagrams of the ear and nose.

20. Prof. SIEBENMANN presented a set of **Tympanic Canulæ**.

Discussed by Prof. BEZOLD.

21. Dr. HARTMANN demonstrated **Gutzmann's Stroboscope** to facilitate lip reading by deaf people; a small **Hearing Appa-**

ratus made of celluloid to enlarge the surface of the auricle, analogous to the hand placed behind the ear; and a modified glass dish to catch the fluid during the syringing of the ear.

22. Dr. EULENSTEIN, Frankfort, exhibited a **Portion of the Left Internal Jugular** which he had **Resected** on April 18th of this year in a twenty-five year-old patient. The vein contained a purulent softened thrombus. It was a case of cholesteatoma of the left temporal bone in which severe pyæmic symptoms developed. The middle-ear region was exposed according to Zaufal's method, and a large extradural abscess in the left posterior cerebral fossa evacuated. Owing to the extensive pachymeningitis externa it was very difficult to distinguish the wall of the sinus from the remaining dura. The sinus was accidentally opened and pus escaped. With a sharp spoon the channel was then cleansed. The chills continued, and on the third day after the operation the jugular vein was ligated. The jugular felt soft, and on section a soft puriform thrombus appeared. The incision was then enlarged to within 3 *cm* of the clavicle, and another ligature applied, but it was impossible to get beyond the thrombosis. It is remarkable that beyond some tenderness on pressure no other sign of thrombophlebitis existed. Jaundice, infarction of middle lobe of lung, swelling of spleen, and albuminuria were present but later disappeared. At present, five weeks after the operation, there is dulness over the lower part of the left lung and purulent expectoration. The temperature varies between $36^{\circ}.8$ and $38^{\circ}.2$; the general condition is satisfactory.

Next year the meeting will again be held on Easter in Dresden.

REPORT ON THE PROCEEDINGS OF THE SECTION
ON OTOLOGY AT THE SIXTY-EIGHTH MEETING
OF THE GERMAN NATURALISTS AND PHYSI-
CIANS IN FRANKFURT ON THE MAIN, SEPTEMBER,
1896.

BY DR. E. BLOCH, FREIBURG-IM-BR.

Translated by Dr. ARNOLD H. KNAPP, New York.

FIRST SESSION, SEPTEMBER 21ST.

The chairman, Dr. O. WOLF, opened the proceedings with a few introductory remarks.

I. Professor KÖRNER, Rostock : **Demonstration of Specimens.**—(1) A temporal bone designated for teaching purposes, with a section through the tympanum and the antrum ; the part which is usually removed in operation was sawn out of the anterior half of the temporal bone in the form of a wedge. (2) A specimen showing spontaneous recovery, as after Zaufal's operation. (3) Examples of tuberculous disease. The author emphasized the fact that the infection can not only be transmitted through the tube, as by coughing, but also by way of the blood circulation. The latter method explains the frequent extensive destruction of bone. A specimen showed an acquired fissure in the tympanic wall of the carotid canal, another had a fistula in the posterior wall of the auditory canal. In one case the tuberculous affection of the tympanum and mastoid process was older than the disease of the lungs. In another case there was an acute otitis media with mastoid complication, fever, and pain. An operation was performed, but the subsequent course showed progressive involvement of the bone so that two further operations were required. The lungs became affected, and a general miliary tuberculosis set in ; tubercles extended directly from the dura into the brain substance. The temporal bone showed large losses of substances.

In the case of a two-year-old child, there was an extradural abscess found under the squama and destruction of bone in the direction of the posterior fossa, probably the result of a primary tubercular osteo-myelitis.

Tubercular disease of the mastoid and of the tympanum differ both clinically and anatomically in various cases; several characteristic groups of symptoms could be devised.

Discussion.—Dr. v. WILD cited the case of a patient with lupus who was taken ill with a tubercular otitis media, with pain and continuous fever. The symptoms persisted, notwithstanding two operations on the mastoid, until a radical operation was performed.

Dr. JANSEN: In children caries is not so frequent as in adults. In the latter the process continues more rapidly after operation, and in the presence of cholesteatoma tubercular granulations appear.

Dr. BLOCH reported a case of a phthisical patient with advanced destruction of the petrous portion of the temporal bone. At autopsy only the upper wall remained. An operation had been performed and the patient's general condition for a time improved.

Dr. KÜMMEL: Tubercular disease of the ears in children is often not recognized, as they do not complain of the ears and the general symptoms are more prominent; nevertheless enormous destruction of bone can take place. He does not like to operate in tuberculous cases.

Professor PASSOW was forced to operate on three tuberculous patients on account of a periosteal abscess. Improvement and rapid cure followed. In the case of a child with fever and pain over the right mastoid, a large cavity was found directly under the skin. The bone was wanting, normal dura was exposed to a large extent, and the sinus seemed healthy. Meningeal symptoms appeared in a few days. Optic atrophy, a large solitary tubercle in the cerebellum, and miliary tubercles were found on the base of the brain.

Dr. KUHN also thinks that an operation must often be done in tuberculous patients. It depends chiefly upon the form of the disease. In adults the ear is usually secondarily invaded. In the presence of certain indications the operation can be attempted. In children where the process is often localized to the temporal bone, a cure can be effected by the radical operation.

Dr. KÜMMEL would also operate if the indications are urgent.

To simply cure an otorrhœa is not a sufficient reason for the radical operation.

Dr. HARTMANN: At the autopsies of phthisical patients extensive destruction in the temporal bone is found, without having given any signs during life. We should only operate when signs of inflammation are present. In the institute for infectious diseases in Berlin, an acute miliary tuberculosis was observed in a case after the perforation of a cholesteatoma, containing tubercle bacilli, into the sinus.

Dr. JANSEN thinks that the bony wall of the labyrinth is sometimes rapidly destroyed in adults, but not in children. He operates under certain conditions, but not on account of a tuberculous otorrhœa alone.

Dr. v. WILD operated on a child several years ago, the tubercular ear-disease was cured, but now there are tubercular ulcers in the larynx. In another child, eight months old, with double subperiosteal abscesses and fetid otorrhœa, a radical operation was performed. The one side healed; on the other a fistula remained, and tubercular adenitis now exists.

SECOND SESSION, SEPTEMBER 22D.

Together with the Section on Neurology and Psychiatrics.

Prof. OPPENHEIM, Berlin: **The Differential Diagnosis of Abscess of the Brain.**—The speaker will limit his remarks to the traumatic and otitic abscesses. In the diagnosis of **Traumatic Abscess**, traumatic meningitis, traumatic neurosis as well as encephalitis must be considered. Traumatic apoplexy can be taken for brain abscess. The hemorrhage after a contusion of the skull may not show any symptoms for weeks or for years until the bloody extravasate has been changed to a cyst. In the latter case the presence of suppuration especially of increasing intracranial pressure must be kept in mind. Functional neurosis like traumatic hysteria and hystero-neurasthenia are also to be mentioned; the cause for the abscess is however absent. According to Friedmann the cause is to be found in a disease of the smaller cerebral vessels.

Otitic Abscesses, even if very large, may remain occult and their diagnosis is difficult as against meningitis, sinus-thrombosis, and extradural abscess. Other cerebral affections with or without ear-trouble may complicate the symptoms, as uncomplicated

otitis media, serous meningitis, brain tumor, arterio-sclerosis, hysteria, and others. Even the usual purulent meningitis may do this; a circumscribed meningitis may simulate an abscess; on the other hand a diffuse may have none or only a few symptoms, as Jansen and others have shown. When a diffuse purulent cerebro-spinal meningitis is associated with a brain tumor the diagnosis is at best difficult to make. In an otitic meningitis it is well to be on the watch for spinal symptoms like stiffness of back, rigid extremities, radiating pain, disturbance in tendon-reflexes, the bladder and rectum. Loss of patellar reflex has been observed in brain abscess. The meningitis which accompanies the otitis may remain localized to certain regions of the spinal meninges, as the lumbar part. According to MacEwen the temperature is normal or subnormal, at least fever cannot be regarded as a diagnostic aid. Continued high temperature is suspicious of some complication to the brain-abscess, transient elevations however are common. The most important sign of a brain-abscess is probably a slowing of the pulse. In the diagnosis, a serous meningitis must also be thought of; it may precede a more severe disease. Lumbar puncture may be of diagnostic value in this case, though this test may fail. Symptoms similar to those of brain abscess may be caused by uncomplicated otitis media, *e.g.*, disturbance of equilibrium, headache, etc. Non-suppurative encephalitis, especially the encephalitis hemorrhagica, may simulate an abscess suspected. Under the cloak of an hysteria a severe brain affection can be concealed.

Discussion: Dr. LEUTERT is in favor of lumbar puncture in the differential diagnosis of meningitis and sinus thrombosis. A few cubic centimetres of the fluid are sufficient.

Dr. FREUND draws attention to the fact that a displacement of the vessels at the base of the brain may produce similar symptoms (hemianopsia). Anæsthesia dolorosa in the face starting from the Gasserian ganglion or branches of the fifth nerve may be focal symptoms or due to pressure.

Dr. EULENSTEIN emphasizes the difficulty of diagnosis between tumor and abscess, and cites a case of fetid otorrhœa with tubercles of the brain and areas of softening.

Prof. KÖRNER: It must never be forgotten that the symptoms in children differ from those in adults. Up to the twentieth year, a simple otitis media may show severe cerebral symptoms, or a sinus thrombosis or extradural abscess in the middle cerebral

fossa may simulate meningitis. Extradural abscesses produce aphasic symptoms only in children.

Prof. OPPENHEIM thinks that we are not sufficiently experienced in lumbar puncture, to decide on the method. In adults a simple otitis media may cause very severe symptoms.

THIRD SESSION, SEPTEMBER 22D.

I. Dr. OSTMANN, Marburg: The relation between **the eye and the ear**. This usually depends on changes in the eyes consecutive to ear disease.

The influence which the ear exerts through the vestibular branch of the eighth nerve on the muscles of the eye is well known. It has frequently been shown by experiment and confirmed by clinical observation that excitation of the membranous labyrinth produces nystagmus. Excitation of one side causes bilateral movements of the eyes.

Double and secondary sensations, have often been observed. The light and color sensations caused by perception of sound are referred to the ear, and the function of the eye is undisturbed.

The conjoined excitation of one sense on the stimulation of another must also be mentioned.

In severe otitic suppuration, changes at the optic papillæ are noticed, and the importance of an ophthalmoscopic examination is acknowledged. In thrombosis of the cavernous sinus the swelling of the eyelids is the most characteristic of the ocular symptoms.

Discussion: Dr. KÜMMEL has observed a purulent infiltration of the Gasserian ganglion without presence of trigeminal neuralgia.

Dr. STEIN has often found nystagmus in certain directions and changes in the pupil in his experiments.

Prof. SCHWARTZE. It is well known that touching a semicircular canal with a probe causes lateral, and never rotatory, nystagmus. He asks whether the presence of a neuritis optica can be explained by a tympanic affection alone.

Dr. OSTMANN does not think so and therefore considers optic neuritis an indication for operation.

Dr. JANSEN has not always observed nystagmus on probing an exposed semicircular canal even when this could be taken for healthy.

Prof. SCHWARTZE : That nystagmus is wanting in destruction of the ampulla is conceivable.

Dr. O. WOLF asks if vertigo was also noticed on probing.

Prof. SCHWARTZE : Vertigo is always present in such cases.

Dr. JANSEN : Vertigo can also be wanting in defects of the semicircular canals.

2. Prof. SCHWARTZE : **Cholesteatoma Verum Squamæ Oss. Temp.**—The speaker exhibited the temporal bone of a man, forty-one years old, who died of phthisis. A large cholesteatoma was found in the squamæ. The middle ear was free, a scar in drumhead, no history and no traumatism. The specimen speaks against the immigration theory.

3. Prof. SCHWARTZE : **The Excision of Carious Ossicles.**—The speaker presented a collection of about 2000 carious mallei and incudes which had been extracted from the auditory canal or during mastoid operations. The head of the malleus alone is frequently carious, still more frequently the incus, especially its long process ; the articular surfaces of the two bones are usually intact, and are very seldom the starting-point of the disease. In some cases ankylosis has been found, more rarely exostoses or osteophytes. Perforation in Shrapnell's membrane just over the short process is characteristic for caries of the hammer. The speaker still maintains his attitude against the operation from the auditory canal (Stacke), and advises a radical operation when the process had extended or in the presence of cholesteatoma.

Discussion : Dr. JANSEN has seen carious ossicles extracted in completely healed cases, and healthy ossicles removed in cases of perforations in the upper part. Such perforations can be caused by a mastoid suppuration where the bone is sclerosed and adhesions to the labyrinthine wall exist ; thus the membrana flaccida is the only outlet.

Prof. SCHWARTZE : Only perforations vertically above the short process, and not others in Shrapnell's membrane prove caries of the hammer.

4. Dr. LEUTERT, Halle : **Pyæmia and Sinus Thrombosis.**—The difficulty in the diagnosis of a sinus thrombosis would be removed if we could assume that pyæmia in cases of suppurative ear-disease and acute empyema of the mastoid was always caused by sinus thrombosis. It has not been proven that a thrombosis of the diploic veins can produce pyemia. The condi-

tions about the jugular bulb are favorable for the formation of a thrombus; the dilatation of the venous channel and the accompanying vortical movement. The speaker tries to explain the failure to find a thrombus as due to an inaccurate search, especially in the bulb. The small diploic veins need not be considered, because they become so rapidly occluded as to prevent the accession of larger quantities of toxins into the circulation. The process in the mastoid cannot be compared to an acute osteomyelitis where the medulla with its broad, thin-walled vessels are affected. Leutert thinks that the lymphatic circulation can also be excluded. He therefore comes to this conclusion: continuous fever in acute or chronic middle-ear disease without retention of pus, and when meningitis can be excluded, is due to an affection of the sinus. Chills during the acute stage, with no other sufficient cause, confirm the diagnosis. It is important to distinguish between parietal thrombi and occluding thrombi. The former when smooth do not furnish bacteria to the blood, and are also less dangerous to the brain. Puncture of a sinus is of doubtful value, as in case of a wall thrombus there may be fluid blood or the thrombus may be situated at the bulb.

Dr. Leutert sums up his views as follows: 1. Pyæmia without sinus thrombosis has not yet been shown to exist and can be excluded in making the diagnosis. 2. The diversity of metastases following sinus thrombosis in acute and chronic otitic suppurations is explained by the various kinds of thrombi. 3. In every case of empyema of the mastoid following an acute otorrhœa and where the temperature is 39° or over, notwithstanding free drainage from the tympanum, we should operate and expose the sinus. 4. In acute cases, if the fever has not fallen on the third day or after a fall of temperature high fever again sets in with or without chills, the sinus should be freely opened. 5. If the case is acute and high fever has existed for several days, or, in a chronic case, if high fever appears for a number of days, even if the mastoid involvement is not marked, the sinus should be opened at the first operation. Meningitis, of course, should first be excluded by lumbar puncture. 6. High temperatures in small children have not the same diagnostic significance, but the possibility of a sinus thrombosis must be kept in mind. 7. Isolated thrombi at the jugular are usually caused indirectly by bacteria which have passed through the diseased sinus wall. 8. Conclusions may only be drawn from the puncture when the latter is positive.

5. Dr. EULENSTEIN, Frankfort, presented a case of **Otitic Pyæmia Cured by Resection of the Thrombosed Int. Jugular Vein**. This case was reported at the Nürnberg Meeting, see p. 118, and is published full in this number, p. 147.

6. Dr. HARTMANN, Berlin: **Ligature of the Jugular Vein in a Case of Brain Abscess and Sinus Thrombosis Terminating Fatally**.—The patient had suffered with a long-standing otorrhœa on one side. From time to time there would be an exacerbation of the symptoms with cerebral signs, which would disappear on restoring the drainage from the middle ear. Fever, headache, and vertigo persisted, and the radical operation was resorted to with exposure of the sinus, which seemed healthy. The symptoms persevered with chills and protrusio bulbi. The sinus was opened, and contained pus and blood. The middle cerebral fossa was also opened above the auditory canal, and a quantity of very offensive pus was evacuated. Recurrence of chills and increasing stupor led to ligature of the int. jugular vein, which was not thrombosed. Sudden death four days later.

At the autopsy the abscess cavity in the temporo-sphenoidal lobe was contracted. The tegmen tympani was carious, and the adjacent dura contained a circular defect three-quarter inch in diameter. The upper part of the sinus contained a firm thrombus, in the lower part the sinus was surrounded by pus, and contained a slight amount. No meningitis.

To the symptoms of brain abscess were added those of a pyæmic process. Neither the opening of the sinus nor the ligature of the jugular vein was of any avail.

7. Dr. LUDWIG, Frankfurt: **Report of a Case of Purulent Sinus Thrombosis and Pyæmia**.—The patient had otorrhœa for three weeks, high fever, vertigo, tenderness along the right sterno-mastoid, and chill every other day. The mastoid region was painful on pressure. At the operation, a cavity was found filled with granulations; the exposed sinus was dark red, covered with granulations. On aspiration the sinus was found to contain bloody pus; it was freely laid open, cleansed, and packed. The symptoms gradually subsided, though an abscess formed in the arm and below the chin. The patient has now been free from fever for two weeks, and is almost cured.

Discussion to 4, 5, 6 and 7.—Dr. KÜMMEL thinks that a thrombosis may exist in any part of the petrous bone, as well as in the jugular bulb.

Dr. JANSEN agrees perfectly with Dr. Leutert, both in the question of diagnosis and etiology. He does not, however, consider it necessary to incise instead of puncturing the sinus. In cases of circumscribed meningitis lumbar puncture is of no value.

Dr. LEUTERT replied that he did not deny the possibility that thrombi could exist in the petrous bone, but did not think that they could produce pyæmia. Simple puncture of the sinus may be fallacious. Lumbar puncture in diffuse meningitis gives positive results; in circumscribed meningitis we can safely operate on the sinus.

Dr. JANSEN: Circumscribed meningitis may also be a contra-indication.

Prof. KÖRNER: It has not yet been shown that an osteophlebitis cannot exist in the mastoid process, or that pyæmia cannot originate from this cause.

FIFTH SESSION, SEPTEMBER 24TH.

I. Dr. JANSEN, Berlin: **On a Frequent Form of Labyrinth Affection in Chronic Middle-Ear Suppuration.**—The speaker has observed 170 cases of purulent inflammation of the labyrinth. Defects existed usually in the horizontal semicircular canal and were caused almost always by cholesteatoma, rarely by tuberculosis or scarlet fever. In the latter forms the disease started from the tympanum, while in cholesteatoma it originates in the antrum. He has frequently observed traumatic opening of the circular canals, usually the horizontal one. The symptoms are uniform and characteristic: vertigo, nausea, vomiting, unstable gait, horizontal or rotatory nystagmus. The examination of hearing usually showed no change. When the bony canal alone was opened, all symptoms were wanting.

In the purulent labyrinth-inflammations the circular canals and vestibule are more frequently affected than the cochlea. They occasionally show no symptoms, especially in small children. Disturbances of equilibrium are less in cases of central origin than in labyrinth-affections and occur more frequently than nystagmus. The defects in the upper canal give the same symptoms as the latter.

Eighty-three per cent. were cured. In 8-10 per cent. meningitis followed.

The diseased parts of the labyrinth were treated surgically in a few cases; the vestibule or the horizontal canal was scraped, a part of the labyrinth capsule and granulations were removed. Diseases of the labyrinth, however, may be recovered from spontaneously.

Discussion.—Dr. ADLER: In operative cases, in fractures of the base of the skull or meningitis when the violent symptoms have disappeared, deafness on one side remains. The disturbances of equilibrium appear when eyes are closed toward the affected side and the vertigo is increased when the head is turned to the affected side.

Dr. RUDLOFF cited a case where the horizontal canal was opened in an operation for carcinoma; followed by disturbances of equilibrium but no nystagmus.

Dr. SZENES observed disturbed equilibrium, vomiting, intermittent pulse, and feeble respiration during syringing with a tympanic catheter.

Prof. GUYE has observed disturbance of equilibrium on turning to the diseased side, most rarely to the other.

2. Dr. GURANOWSKI, Warsaw: **Report of Cases of Labyrinth Necrosis.**—In a case of long standing middle-ear disease with mastoid involvement, the radical operation was performed. Three months later a sequestrum was discharged which consisted of the three canals and a part of the vestibule. (Specimen was demonstrated.) Cured.

3. Dr. VOHSEN, Frankfurt: **The Operative Exposure of the Attic and a Plastic Operation on the Auditory Canal.**—The speaker demonstrated a trephine-like instrument with guard which prevents injuries in the depth. For the plastic operation a method of suture was shown which fastens the flap to the bone and prevents the sloughing.

4. Dr. SELIGMANN, Frankfurt: **On the Treatment of Subjective Noises in Sclerosis of the Middle Ear.**—The speaker exhibited an electrical apparatus combined with a Siegle's speculum. Like Delstanche's apparatus the purpose is to move the chain of ossicles but more rapidly. Seligmann has been able to stop the tinnitus for hours after application of his instrument for one or two minutes, when the case was not one of nerve-deafness. The hearing is unaffected. Cases where the drumhead is movable are of course most applicable. The difference in the effect on the tinnitus and the hearing power suggests the question whether the

noises are not originated elsewhere than the disturbance of hearing.

Discussion.—Dr. V. STEIN: On account of the pain which the application of the Lucæ pressure-probe occasionally produced, the speaker has had another instrument made, which he then described.

A CASE OF TUBERCULAR CRIES OF THE
MIDDLE EAR PERFORATING THE FENES-
TRÆ ROTUNDA AND OVALIS—WITH RE-
PORT OF MICROSCOPIC EXAMINATION.*

BY DR. WALTER HAENEL, DRESDEN, GY.

Translated by ADOLPH O. PFINGST, M.D., Louisville, Ky.

(With Plates VI. and VII. of Vol. XXVIII., German Edition.)

THE microscopic changes brought about in the ear by tuberculosis have been the subject of repeated investigation. No one has done as much in this field of research as Habermann¹ who contributed eight cases to the literature on the subject, which he had subjected to a very careful and thorough microscopical examination. I will consider only those cases in which, beside the middle ear, the tuberculous affection had invaded the internal ear. Of this kind I was able to find, beside three of Habermann's cases, one each by Steinbrügge, Gomperz, and Gradenigo.

In Steinbrügge's² case a perforation at the upper border of the carious base of the stapes was the cause of the invasion of the labyrinth by the disease. Marked pathological changes had taken place, reaching into the nerve channels.

Gomperz³ was able, in his case, to trace the point of invasion of the labyrinth by the purulent inflammation to the bony wall separating it from the tympanum which was in a state of dissolution. Gradenigo⁴ described, in his publication, a lupous condition of the middle ear which had per-

* From the Ear Dispensary of the Medico-Clinical Institute of Munich.

forated the fenestra rotunda and caused destruction of the annular ligament of the fenestra ovalis. It had reached the outer semicircular canal through the facial canal and caries of the bony wall between the facial and the semicircular canals.

Of the three cases of the kind published by Habermann, only one showed evidence of early invasion of the internal ear. In this case the disease was propagated to the inner ear through caries of the promontory, just below the fenestra ovalis. In his other two cases the caries had been so extensive that Habermann was not able to determine positively the location of the perforation into the labyrinth. He believed, however, that the infection had occurred through caries of the labyrinth capsule.

The case which I report was seen by me during life and the parts studied microscopically after death of the patient. The point of perforation into the internal ear could readily be made out owing to the localization of the necrosis and is consequently especially interesting.

The child, who had always been feeble, was admitted to the children's clinic in Munich, May 14, 1895, when three months old, suffering with general furunculosis. Paternal history good. Mother died shortly after the birth of this, her only child, of galloping consumption.

A month ago pus began to come from the right ear of the child. Facial contraction on the left side dates from about the same time.

On May 21st, when I was called in to see the anæmic, and badly nourished, child there was still a general furunculosis and the cervical glands on both sides were enlarged. There was total paralysis of the right side of the face; the palate and uvula were in their normal position. The auditory canal of the right side was filled with foul pus of rather thin character. In the depth of the ear canal, at its posterior superior aspect, some pale granulations could be seen surrounding the small bones and remnants of the drum-membrane. Upon passing a probe beyond the under side of the mass I came upon naked bone which was roughened below and anteriorly but felt smooth at the promontory.

During cleansing of the ear on May 23d the malleus, free of

mucous membrane, was discharged. The manubrium, up to within a short distance of the short process, was missing. The rest of the bone showed superficial necrosis. On the next day the incus also came away. It was free of mucous membrane but microscopically showed no necrosis.

On May 27th the granulation tissue spoken of had disappeared, displaying the inner wall of the middle ear. There was a rapid diminution of the vitality, and, upon the following day the child died.

The post-mortem examination revealed acute miliary tuberculosis of the lungs, liver, and spleen, starting from old cheesy tubercular cervical, thoracic, and mesenteric glands. The right petrous bone was carious. There was general furunculosis and muscular atrophy; also catarrhal enteritis.

I examined the temporal bone more accurately and found the dural covering smooth and of normal appearance corresponding to the position of the petro-squamous suture; a number of grayish yellow miliary tubercles were to be seen on the under surface of the dura. They were arranged in a row. The bone near the petro-squamous suture—the tegmen tympani and the horizontal portion of the squamous bone—was discolored (green) and dark. The ear canal and tympanic cavity were filled with foul discolored pus, of creamy consistence with numerous flocculi. It was very difficult to cleanse the recesses of the middle ear. Examined microscopically, isolated tubercle bacilli were demonstrable in the pus. The drum membrane, malleus, and incus were absent. The sulcus tympanicus had been totally destroyed. Not a remnant of normal mucous membrane could be found in the tympanic cavity. On the apex of the promontorium it was entirely absent, displaying the white bony wall. In the anterior part of the tympanic cavity small shreds of yellowish-gray mucous membrane could be seen between islands of roughened, exposed bone. The fenestra ovalis was also covered by discolored mucous membrane. The stapes in its normal position was freely movable and almost free of mucous covering. A small bead of granulation tissue projected from the fenestra rotunda. The

stapedius and tensor tympani muscles had lost their tendons. A small cheesy lymphatic gland was present on the under side of the petrous bone, internally to the annulus tympanicus. The antrum and osseous portion of the Eustachian tube were not opened, in order to preserve the specimen for sections.

The specimen was kept in Müller's fluid for some time (semicircular canals having been opened), then put in alcohol, decalcified in 5 per cent. nitric acid, dehydrated, and imbedded in celloidine.

A series of sections were made perpendicular to the upper border of the petrous-bone, eighty of which were examined and following conditions noted: The osseous portion of the tube near isthmus showed no change. The pathological process had begun near the ostium tympanicum tubæ and extended over the entire tympanic cavity and the antrum. The epithelium of the mucous membrane was exfoliated and in places wanting with exposure of bone. The periosteum showed evidence of inflammation; the blood-vessels were dilated and there was an infiltration of leucocytes. In portions necrosis was in progress recognizable by the lessened affinity of the nuclei for stain. In other places the tissue was entirely broken down and had undergone caseation. These caseous patches were of different sizes, superficial or deep. The superficial ones had been cast off in several instances which gave the mucous membrane a lacrated appearance. Numerous small hemorrhages had taken place in the infiltrated areas.

A hypertrophic condition of the mucous membrane was present but in a few places. In the fenestræ this condition was most marked, with a considerable increase of connective tissue and blood-vessels. The granulation tissue never attained any great size for it soon became necrotic.

The involvement of the bone was marked. A number of Howship's lacunæ of various depths extended into the bone from the periosteal surface. Some were so deep that they opened into the enlarged medullary spaces and Haversian canals. The same pathological process characterized by cell infiltration, caseation, and occasional tissue hypertrophy had

taken place in the lacunæ, medullary spaces and Haversian canals. The bony canals had become larger and coalesced through absorption of necrotic bony tissue. This gave the bone a corroded appearance. These changes were most marked in the superficial layers of the bone though in places the process has extended to the medulla and the superficial bone remained smooth. This accounts for the brittle condition we often meet with in chiselling the apparently healthy bone during the mastoid operation. Bezold⁵ looks upon this condition as characteristic for tuberculous necrosis. Most of the lacunæ, when the mucous membrane and periosteum have disappeared, were empty. In some large multinuclear cells or osteoblasts were present, but they also seemed to be beginning to undergo necrosis as the nuclei took the stain poorly and the cell outline was not clearly defined.

The advanced stage of necrosis accounts for the absence of the characteristic giant cells. There were some isolated large cells containing several nuclei at the junction of the infiltrated and necrotic tissue which were possibly giant cells.

As with the mucous surface it was the exception for new granulation tissue to be found in the lacunæ of the medullary spaces and Haversian canals.

We find the necrosis of the mucous membrane most marked over the prominences and least in the recesses of the walls of the middle ear.

Thus the annulus tympanicus is bare and its surface is irregular and rough owing to the lacunar absorption in the bone. The sulcus tympanicus has been entirely destroyed and the entire drum membrane is absent. The necrosis has invaded the innermost portion of the ear canal exposing the corroded bony wall. The bone at the floor of the middle ear had also been involved in the carious destruction. The most marked changes, however, have taken place on the inner wall of the tympanic cavity, in the upper and anterior angle of which (the part covering the cochlea) the necrosis has reached a considerable depth. A thin lamella of bone separates the enlarged necrotic medullary spaces from the second and third turns of the cochlea (c. Fig. 1).

The spaces communicated with the surface by large defects. These defects in the bone have reduced the wall of the cochlea to about one sixth of its normal thickness. The medial wall of the tympanic cavity in front of the promontorium was similarly affected. The enlarged medullary spaces, which opened on the surface, extended downwards and inwards leaving but a thin sheet of bone between them and the cochlea (c. Fig. 1).

From the wall of the cochlea the necrosis had extended into the cochleariform process and the roof of the tympanic cavity, giving to these parts a worm-eaten appearance. The necrotic area included the canal for the tensor tympani. The muscle had been entirely destroyed.

The promontorium, which was devoid of mucous membrane though smooth on the surface, contained enlarged and infiltrated medullary spaces on the interior (c. Fig. 2).

The fenestra rotunda, as the avenue by which the infection reached the labyrinth, is worthy of our special consideration. In a section through the fenestra rotunda it was seen that its anterior external wall had become corroded up to the attachment of the spinal ligament (c. Fig. 2). A mass of highly vascular granulation tissue of considerable size projected from the lacunæ (Fig. 2, Wuch. 2), filling up about half of the fenestra. The tissue gradually coalesced with the membrana tympani secundaria. The other half of the fenestra was covered by cheesy pus. The scala tympani behind or really internally to the membrana tympani secundaria was almost completely filled with the same granulation tissue (Wuch. 3) that projected from the enlarged medullary spaces, and was continuous with this. Both went over into what was left of the membrane covering the fenestra. This could be seen as a fibrous band extending from the medial towards the lateral wall of the fenestra until it was lost in the granulation tissue. Near the surface in the tympanum the granulations have undergone cheesy degeneration.

Sections in the immediate neighborhood of the fenestra rotunda showed granulation tissue covering the floor of the scala tympani, but the farther away from the scala the sections were taken, the less granulation tissue was present.

In those made through the axis of the modiolus, there was none of it to be seen, the dilated lymph channels being the only indication of the process. Farther up in the cochlea these also were normal but there was some dilatation of the blood-vessels of the periosteum and the bone. Sections through the aqueductus cochleæ showed that it also contained granulation tissue.

The most plausible interpretation of these microscopic conditions is that necrosis began in the lacunæ of the lateral bony wall of the fenestra coincident with which there was a formation of granulation tissue in the necrosed areas. This process of new formation had involved the outer surface of the membrana tympani secundaria before caries had progressed far enough in the bone to cause the membrane to become detached from it. As the process continued and caused dissolution of the fibres of the membrane the granulations found free access to the scala tympani through the fenestra.

Histological changes very much like those described had also taken place in the fenestra ovalis (c. Figs. 2 and 3), and, as at the fenestra rotunda, an invasion of the labyrinth had resulted. The stapes, though almost devoid of mucous membrane, was not displaced. The posterior and upper portion of its base to about its middle and the annular ligament were covered by proliferating mucous membrane (c. Fig. 3, Wuch., 1). The posterior and upper bony wall was necrotic. A very thin lamella separating the vestibulum from the granulations in the tympanic cavity remained. The base of the stapes was necrotic at the upper extremity. The annular ligament had been involved in an area of cheesy degeneration in front of and below the stapes (c. Fig. 2). Its former position was indicated by a narrow chink. This was separated from the vestibulum by the very much thickened periosteum. This thickening of the vestibular periosteum, which was due to an infiltration and also to increase in the tissue cells, had taken place only in the immediate vicinity of the fenestra ovalis.

The facial canal communicated through defects of its bony wall, the result of caries, with the tympanic cavity; posteriorly,

with the aditus and with the cancelli of the spongy bone. Some of the defects were empty, while others were filled with detritus of the neighboring parts. The facial nerve appeared normal up to the bend. In the tympanum it was broken up into filaments, and only took on a diffuse stain; the fibres failing to react to Weigert's method. These degenerative changes had taken place in the nerve in its entire course through the descending portion of the Fallopian canal. Portions of the nerve were surrounded by cheesy pus. In other portions granulation tissue had pushed forwards and was in apposition with the nerve. One section through this tissue contained two typical miliary tubercles.

There was a carious defect on the medial side of the pyramid filled with products of necrosis. The stapedius muscle was absent. Remnants of its tendon were still visible. The recesses in the back of the pyramid were filled with cheesy pus.

The pathological changes in the aditus and antrum were identical with those in the tympanum. Dissolution of the cancellous tissue was particularly marked near the upper and external walls. There were several defects in the tegmen tympani. The horizontal semicircular canal was surrounded by healthy bone, as the medial wall had only suffered slightly from the necrotic destruction. The ampulla of the horizontal canal was closest to the diseased bone, but it had not been affected.

There were no other changes in the internal ear than those described in connection with the fenestra ovalis and rotunda. The auditory nerve was not affected.

This case, which corresponds in many respects to the ones described by Habermann, has a number of very interesting features.

The extent which the process had reached in so short a time is the most noteworthy. The child was barely three months old, and had showed no evidence of ear disease until a month before its death, when the ear began to discharge pus. The tendency to tissue proliferation and formation of granulations and polypi, which usually characterizes this destructive process in children (Bezold²), was not pres-

ent in this case. The case rather resembled, or I might say was identical with, the tubercular otitis media of the adult.

It is difficult to say how the infection of the middle ear was brought about in my case; whether the bacilli entered the tympanum through the Eustachian tube, or through the circulatory system. The theory advanced by Habermann (*l. c.*), that the general atrophic condition of tubercular patients, which naturally also includes the tube, increases its lumen, and consequently also the danger of infection through it, seems plausible. There is no doubt that the ear trouble in this case preceded the general miliary tuberculosis, as evidenced by the microscopic examination of the organs involved.

As regards the invasion of the internal ear, we have seen that it had taken place through the fenestra rotunda and fenestra ovalis, but that the changes in the internal ear had been very slight.

The carious destruction of the bony wall of the fenestra rotunda had caused a detachment of the membrane covering up the opening on one side, in that way furnishing a free avenue by which the granulation tissue could enter the periosteum of the labyrinth. At the fenestra ovalis the delicate annular ligament had given way to a caseous degeneration. In both instances the endothelial layer (in one of the membrane, in the other of the annular ligament) had become thickened, averting a free communication between the perilymphatic spaces and the tympanum. The process would, without a doubt, have eventually involved this structure.

The infection of the dura mater, which had taken place through the petro-squamous suture, had remained localized.

The degeneration of the facial nerve below the geniculate ganglion corresponds to the clinical history of the case—paralysis of the entire region supplied by the nerve.

Unfortunately, we are deprived of a functional examination in this case on account of the age of the patient. It would, however, be natural to assume that the hearing was impaired. The destruction of the intrinsic muscles, the loose condition of the stapes brought about by partial de-

struction of its ligament, and the partial destruction of the membrana tympani secundaria, with the interposition of a mass of granulations, would all go to indicate this. The terminal distribution of the auditory nerve had nowhere been involved in the necrotic process, although the very thin wall of the cochlea indicates the imminent danger of an early invasion of the cochlea.

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⁵Bezold, "Die Krankheiten des Warzentheiles" in Schwartz's *Handbuch der Ohrenheilkunde*, Bd. ii., S. 331.

⁶Bezold, *Ueberschau über den gegenwärtigen stand der Ohrenheilkunde*, 1895.

Explanation of the Plates.

FIG. 1.—A vertical section of the petrous bone through the anterior portion of the tympanic cavity. The section is almost parallel to and behind the modiolus of the cochlea. It shows the carious condition of the walls of the cochlea, cochleariform process and tegmen tympani.

At the floor of the scala tympani of the first turn of the cochlea the granulations are to be seen which have originated in the wall of the fenestra rotunda (W).

Wind. I, II, III : first, second and third turns of the cochlea.

Sc. v. : Scala vestibuli.

Sc. t. : Scala tympani.

D. c. : Ductus cochlearis.

Pr. c. : Processus cochlearis.

FIG. 2.—Section through the highest part of the promontorium including the fenestra rotunda and the fenestra ovalis (section almost at right angles to upper border of petrous bone) shows the points of invasion of the internal ear, the degeneration of the facial nerve and caries of its bony wall as well as caries of the floor of the tympanum.

Can. fac. : facial canal.

Por. ac. int. : internal auditory canal.

Vest. : vestibulum.

Can. n. p. amp inf : canal for branch of auditory nerve supplying lower ampulla.

Lig. a. : annular ligament.

D. : defect in annular ligament.

P. : hyperplasia and infiltration in the periosteum of the vestibulum.

Stap. : stapes with its antertor crus.

Pr. : promontorium.

M. m. : enlarged medullary spaces.

Lam. spir. : lamina spiralis.

Lig. spir. : ligamentum spirale.

Membr. tymp. sec. : membrane of the fenestra rotunda showing its detachment from the lateral bony wall and how its end becomes broken up into filaments to terminate in the granulation tissue.

Wuch. 1. : proliferation at the upper border of the fenestra ovalis. Caries of the bony wall.

Wuch. 2. : proliferation in the fenestra rotunda showing its inward invasion.

Wuch. 3. : proliferation in the scala tympani.

C. : caries of the wall of the fenestra rotunda.

G. G. : dilated blood-vessels in the granulation tissue.

K. K. masses of cheesy material.

FIG. 3.—Parallel section to the former, but taken more posteriorly, through the fenestra ovalis.

Shows the changes at the fenestra ovalis, degeneration of the facial nerve and caries of the tympanic cavity.

Stap. fp. : base of stapes with caries on its tympanic side.

Stap. k. : head and crura of stapes.

Wuch. 2 : tissue proliferation below the fenestra ovalis. (A continuation of the tissue represented in the previous figure Wuch 2.)

For the explanation of the rest of this figure, see Fig. 2.

PAPILLOMA OF THE SEPTUM NASI.

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(With three figures on text-plate I.)

FEW cases of true papilloma of the nose are recorded in literature. The following case is an illustration of this form of intranasal growth, and presents certain points of interest which appear to justify its publication.

J. B., fifty-two years of age, a gamekeeper, presented himself at the Ear and Throat Department of the Royal Infirmary, Edinburgh, on September 1, 1896, complaining of complete nasal obstruction, swelling of the right side of the nose, and some interference with the sight of the right eye. He gave the following history: In the summer of 1893, rather more than three years before the date of examination, he began to notice that there was some stuffiness in the right nostril; two or three months later, he received a severe blow on the nose, but he suffered no further inconvenience, save for some temporary pain and hemorrhage. This feeling of stuffiness gradually increased, and in the summer of 1895, two years after the onset of his symptoms, he noticed a swelling protruding from the right nostril.¹ In November, 1895, he received a second blow on the nose, being struck with the stock of a gun. Shortly after this injury, he observed some fullness of the right side of the nose externally, *i.e.* ten months before his examination. This swelling gradually increased in size, the obstruction of the right nostril became more marked and finally

¹ The tumor, with microscopic preparations, was shown at the meeting of the Laryngological Society of London, December 9, 1896, and is the case very briefly recorded in the Transactions of that Society.

complete while the protrusion from that nostril became more evident. There were occasional attacks of hemorrhage and a constant discharge from the right side. During the last year, the left nostril has become completely occluded, the sense of smell has been entirely lost, and the sight of the right eye has latterly become interfered with, along with a tendency for the tears to trickle over the cheek. The patient has always enjoyed good health, and has been a strong, active man.

On examination, the right side of the nose was seen to bulge prominently and form a considerable swelling extending on to the cheek, and reaching upwards as far as the inner canthus of the eye; it did not pass on to the forehead nor did it cross the middle line of the nose. There was no discoloration of the skin covering it. On palpation it was found to be of a soft, semi-fluctuating nature. Presenting at the right nostril, and more evident when the tip of the nose was tilted up, was a mass which completely filled up the vestibule and prevented the introduction of the speculum. Its surface covered with mucous membrane and resembling in appearance the lining of the nasal cavities, showed no evidence of ulceration nor did it appear distinctly nodulated. In consistence it was fairly firm, and a probe passed between it and the ala, without the use of force, could not be inserted to any appreciable extent. In the left nostril, nothing was visible, but the septum was markedly deviated to the left. Examination of the fauces revealed no mass dependent behind the velum palati, nor was there any bulging of the palate forwards. Posterior rhinoscopy was very unsatisfactory, but nothing was felt in the naso-pharynx on digital examination: there was no bulging of the hard palate or anterior wall of the right antrum. There was no glandular enlargement.

The age of the patient, the size of the growth, and its recent more rapid increase, its soft consistence, in conjunction with the occasional attacks of hemorrhage, favored a diagnosis of malignancy, notwithstanding the healthy appearance of the man, and the absence of glandular enlargement. The absence of any expansion of the nasal bones, of any swelling in the nasopharynx and of any protrusion of the right eyeball, showed that the tumor was not growing from the base of the skull and was therefore probably suitable for complete removal. The eyes were examined and no lesion was found.

Professor Annandale being at that time in charge of the de-

partment, I asked him to see the patient; he took a similar view of the case and kindly admitted him to his wards. On September 5th, Professor Annandale operated by means of an incision commencing at the right inner canthus and carried down the side of the nose round the right ala and through the centre of the upper lip. The skin was dissected back as far as was necessary, and the right nasal fossa was then opened into; the tumor was thus exposed occupying the whole of the fossa. The superior, middle, and inferior turbinated bones of the same side had disappeared, absorbed by the pressure of the growth, but the antrum was not invaded. The great bulk of the tumor lay free in the cavity of the nose, and was attached to the bony septum about its middle by a somewhat broad base.

The whole of the mucous membrane covering the right side of the septum was dissected off and the central portion of the bony septum was removed along with the tumor. The removal of the mucous membrane was found necessary on account of the presence of several small accessory buds hanging by their pedicles from it and distinct from the main mass. Bleeding, which was considerable during the operation, was controlled by means of pressure; the skin flap was replaced and sutured and the wound healed rapidly. At the date of writing, four months after the operation, the patient was perfectly well and an examination of the nose revealed no evidence of any recurrence. Nasal respiration was free, but the sense of smell remained absent, as was to be expected after so complete a removal of mucous membrane. The sight in the right eye had improved, and there was no longer the same tendency for the tears to trickle over the cheek. There was a slight falling in of the bridge of the nose due to the removal of the portion of the bony septum.

The tumor, about the size of a small orange, resembled a typical cauliflower mass, and measured six and a half inches in circumference (Fig. 1). Its weight, including the portion of the septum to which it was attached, was one and a quarter ounces.

Microscopical examination showed the structure to be that of a true papilloma, consisting of a delicate branching connective tissue framework containing many blood-vessels with ill-defined walls, and everywhere covered with many layers of epithelial cells distinctly demarcated from the sub-

jacent tissue. There were no mucous glands present. In one or two places there was a breaking down of the line of demarcation between epithelium and stroma, and distinct evidence existed of an invasion of the former into the connective tissue of the tumor. It was interesting also to observe where a small area had not been exposed to pressure, that the normal ciliated columnar type of epithelium had not been replaced by the stratified squamous variety.

A point of very considerable practical bearing existed in the presence of the several small accessory growths distinct in their origin from the main tumor but of similar structure and springing from the mucous membrane of the septum by slender stalks. These small buds might readily be overlooked, more especially in these cases where the tumor can be snared through the anterior naris, and continuing to increase in size, be looked upon at a later date as recurrences.

As already stated, this form of intra-nasal growth is comparatively rare, though it would appear to occur much more frequently than it really does, because many writers, following the nomenclature of Hopmann, have applied this term to the papillary hypertrophies, which are much more commonly met with in the nasal fossæ; it is on account of this that much confusion has arisen. These hypertrophies are situated on some part of the middle or inferior turbinated bodies, usually the latter, while the adjacent part of the nasal floor or septum may occasionally be involved. Though macroscopically there may be sometimes considerable difficulty in differentiating the papillary hypertrophy from the true papilloma, an examination with the microscope will reveal a structural difference, which will prove to be the most reliable means of diagnosis.

The hypertrophy is characterized by the presence of all the constituent parts of the mucous membrane covering the turbinated bones. The folds, which along with the depressions, give to the surface its papillary or mulberry-like appearance, show no evidence of budding or branching, but each communicates directly with the central mass of the hypertrophy. The surface is covered by the normal epithe-

lium of the part, which is not thickened, but forms a more or less uniform layer upon the surface.

The greater part of the overgrowth is composed of a connective tissue stroma in which lie many venous sinuses and here and there small clusters of mucous glands. All these points may be observed in Fig. 3, a drawing of a microscopic section of a mulberry hypertrophy of the posterior end of the inferior turbinal kindly sent to me by my friend Dr. G. J. Palen of Philadelphia. The points of distinction between this and a true papilloma are readily seen if a comparison be made with Fig. 2, taken from a microscopic section of the tumor described above. In addition to the rarity of such tumors, and the fact that they differ histologically from the papillary hypertrophies, it has been found that they usually grow from the septum of the nose, so that there is at once an important distinction in their seat of origin. In the *New York Med. Journ.*, December, 1891, there is a valuable paper on Nasal Papillomata by Dr. Jonathan Wright, in which the differential structure of these growths is described, and the literature of the subject carefully reviewed, while in the *Lancet*, December 8, 1894, Mr. de Santi has a similar paper. As it is needless here to recapitulate what has already been written, I shall content myself with relating briefly the few cases of papilloma of the septum which have been reported since 1894.

Mr. CRESSWELL BABER (*Trans. Laryn. Soc.*, London, April 10, 1805) showed a patient, aged thirty-six, from whom he had removed a mulberry-like tumor, attached by a broad base to the floor of the left nasal cavity and septum, and projecting into the vestibule. The microscopical examination of a portion of the growth removed, is described as showing "hyperplasia of structure." This patient had been previously operated on for a similar growth in the same situation, which had been pronounced to be a papilloma.

WEIL, at a meeting of the Vienna Laryngological Society, May, 1895, showed a large papilloma of the septum from a woman sixty-seven years of age; this was examined microscopically by Zuckerkandl, and the diagnosis that had been made was confirmed.

Dr. JONATHAN WRIGHT describes in the *Transactions of the 17th Ann. Congress Amer. Laryn. Ass.*, 1895, a similar tumor, which grew in the left nostril of a young woman twenty-eight years of age. After removal with the cold snare, the point of its attachment by means of a narrow pedicle was found to be to the upper part of the cartilaginous septum. In structure it closely resembled the tumor described in this paper. At the same time he stated that he had examined histologically a similar tumor removed by Dr. Arrowsmith from the nasal septum of a child of five and a half years of age. I append a table of references to those cases in which microscopic examination has been made.

- Morell Mackenzie, *Diseases of the Throat and Nose*, vol. ii., 1884.
Butlin, *St. Bart. Hosp. Repts.*, vol. xxi., 1885.
Bosworth, *Diseases of the Nose and Throat*.
Solis Ghen, *Revue de Laryngologie*, 1889.
Ingals, *Trans. Amer. Laryng. Ass.*, 1889.
Nuthall, rep. by J. Wright, *New York Med. Journ.*, December, 1891.
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Dunn, *New York Med. Journ.*, April, 1893.
De Santi, *The Lancet*, December 8, 1894.
Cresswell Baber, *Trans. Laryn. Soc. Lond.*, April 10, 1895.
Weil, Vienna Laryn. Soc., May, 1895.
J. Wright, *Trans. 17th Ann. Cong. Amer. Laryn. Ass.*, 1896.
Arrowsmith, *Trans. 17th Ann. Cong. Amer. Laryn. Ass.*, 1896.

A CASE OF OTITIC PYÆMIA CURED BY EXCISION OF THE THROMBOSED INTERNAL JUGULAR VEIN.

BY DR. H. EULENSTEIN, FRANKFORT a. M.¹

Translated by Dr. A. B. KIBBE, Seattle, Washington.

ACCORDING to the collection made by Körner, and cited on page 78 of the second edition of his book, the internal jugular was tied in 41 of 79 cases of sinus disease operated upon. Among these 41 cases there are 4 in which large portions of the vein were excised on account of extension of the disease. The cases were those of Balance, Parker, Pritchard, and Voss. Of these, two were cured, those of Parker and Pritchard, and two died, those of Balance and Voss. The two cured cases indicate that even in those extensive thrombo-phlebitic processes which include the jugular, a prospect of saving the patient is still present. To these I can add a third, ending in recovery, which in many ways appears to be worth reporting.

Patient, F. M., a large strongly built man, aged twenty-five, always previously healthy, consulted me March 12th, on account of a purulent discharge from the left ear which had existed since childhood. Examination showed slight sensitiveness to pressure between the tip of the mastoid and the angle of the jaw. No change in appearance of integument in the vicinity of the ear. Small amount of offensive reddish discharge in meatus. Drum hard and hammer not visible. Instillation of HO brought masses

¹ Read before the Otological Section of the Meeting of German Naturalists and Physicians, Frankfort a. M., Sept., 1896.

of epidermis into the lumen of the meatus. No fever, but the patient complained of frequent headache accompanied by a sense of numbness in the head. A radical operation was proposed and accepted, but postponed at the request of the patient for several weeks. April 13th, the patient again presented himself, saying that severe headache had again set in, that he had had several chills and felt sick. Temperature that evening 41.5° C. The discharge from the ear had almost entirely ceased. An operation appearing to be urgent he was sent to the hospital, and, on April 15th, the operation was performed, exposing the field according to Zaufal. In chiselling away the posterior wall of the meatus a cholesteatomatous mass the size of a small walnut was encountered extending anteriorly as far as the tympanum and filling the dilated antrum, posteriorly reaching to the lateral sinus. In removing the mass, a large perisinuous abscess was evacuated; after exposing the spaces of the middle ear and removing the granulations and cheesy masses present, the sinus was more extensively bared. Its wall being discolored in places and covered with granulations, it was difficult to differentiate it in its peripheral course from the dura, which was also covered with granulations. It being necessary to expose all the diseased area of the dura, the posterior cerebral fossa was exposed over a space of several centimetres. Following the sinus still farther centrally nearly to the jugular foramen, its wall gave way, giving vent to a large amount of pus. After splitting the sinus wall in its long axis, a probe was introduced both centrally and peripherally, without encountering a solid thrombus. The question to be decided now was whether or no the jugular should be ligated. Owing to the loss of blood and the fact that the advisability of this procedure is still an open question, it was decided to await the results of the present operation and to undertake the ligation later should it be indicated. The large cavity in the bone, as well as the sinus, was plugged with iodoform gauze and the usual dressing applied. Temperature that evening, 38.5° C., and the patient's general condition good.

April 16th.—Slight chill at noon, temperature 40.4° C.

April 17th.—Chills at 9 A.M. and 6 P.M., cough and bloody expectoration. Slight sensitiveness to pressure below angle of jaw, though not greater than usual after such an operation. No swelling in neck and no cord could be felt.

April 18th.—Chill lasting twenty-four minutes, at 2 A.M. The bloody expectoration still persists, but with negative pulmonary

findings. A slight jaundice has developed. Ligation of the jugular seeming to offer the only hope of saving the patient, the operation was undertaken. Baring the vein at the level of the upper edge of the thyroid cartilage, its natural blue color was noticed to be lacking, it being of a whitish color. Careful palpation showed it to be soft, with no evidence of adhesions or phlebitis.

Having placed the two ligatures around the vessel, it was cut between them. To my astonishment, yellowish particles of a thrombus oozed out. Going farther down, the same thing again occurred. There remained, therefore, nothing to be done but to extend the cutaneous incision as far as the clavicle, draw aside the sterno-cleido-mastoid muscle and bare the vein as low down as possible. A double ligation was then placed around it once more, and this time the incision gave exit to a few drops of blood. The entire mass ligated, however, still contained thrombus masses, but of a redder color. The entire length of the vein from the border of the thyroid cartilage to a point close to where it empties into the innominate, was then excised. The wound was closed above by two sutures, the lower portion being left open and drained. Cultures made from the thrombus showed streptococci predominating. Between this date and the 24th, several chills occurred. On the latter, an abscess in the cheek ruptured spontaneously into the mouth. Several days later a pus collection in the lower lid was evacuated by incision, and, on the 9th of May, another abscess was opened at the angle of the jaw. From this date recovery was gradual, and the patient left the hospital June 25th. Owing to the severity of the general disease the treatment of the ear was exceedingly difficult, yet the result as regards that organ was very good. No effort was made to obtain a persistent opening back of the ear, as a portion of the mesial wall of the cavity was formed by the contents of the posterior cerebral fossa, which were better protected by a firm cutaneous cicatrix. The patient has been at work since the 1st of August. The hearing power is the same as prior to the operation.

It is most remarkable that there were no evidences in the neck of the extensive disease of the internal jugular. To this condition Crockett has called attention.¹

The abscesses in the left side of the face must be taken as

¹ *Archiv für Otologie*, Bd. xl., S. 32.

an evidence of a thrombo-phlebitis of the facial. In Parker's case, previously mentioned, a portion of the facial was thrombosed, and was excised with the affected area of the jugular. Jansen recommends, after clearing out the sinus, if high fever persists, chills occur, or pus exudes from the bulb, to ligate the jugular and facial also, and slit the former as far as the base of the skull.

With this recommendation I am fully in accord from my own experience, and particularly when the thrombosis of the jugular extends beyond where the facial empties into the former. According to the findings at this point, one may ligate or excise a portion of the vein if it be thrombosed.

With reference to the question of the time when the jugular was tied, I must acknowledge that, now looking back over the entire course of the case, it would have been more correct to have ligated at the time of the findings in the lateral sinus, though it is not certain that at the time of the first operation I should have obtained better results, as the evidences of jugular disease were wanting. In a similar case, however, I should deem it advisable to perform simultaneous ligation.

There is no doubt but that the chills which occurred after ligation indicated further absorption from the small portion of the thrombus below the lower ligation. A similar case, that of Clutton, is cited by Körner in which a portion of the thrombus was included in the ligation. Absorption from the secondary foci in the left cheek must be excluded, as there were the evidences of a thrombo-phlebitis extending backward in the area of the facial which was cut off from its cardiac connection.

From the whole course of the disease it is clear that the ligation, or rather the excision of the thrombosed jugular, did not directly preserve the patient's life, as it was impossible from the condition existing to completely exclude further transportation of infectious particles. It did, however, prevent the continued access of such masses into the circulation.

THE PATHOLOGICAL CONDITIONS IN THE MIDDLE EAR AND SPHENOID SINUS IN TRUE DIPHTHERIA.

BY DR. E. LOMMEL, Thièle.

Translated by Dr. A. B. KIBBE, Seattle, Washington.

THOUGH the complications of disease of the ears in measles, scarlatina, typhoid, tuberculosis, small-pox, and particularly influenza, have been treated of in a number of publications, diphtheria has to a certain extent been neglected, particularly with reference to the pathological anatomy of the ear affections. Under these circumstances it appeared practicable to add a further contribution to this question. The reports are particularly valuable, first, for the reason that more than one half of the cases occurred in 1896 during the existence of a severe epidemic of diphtheria in Basel, and second, because all temporal bones were dissected by Prof. Siebenmann.

In none of the cases was there a complication with scarlatina, and throughout the Löffler bacillus was demonstrated in the membrane either during clinical observation or post-mortem, both by cover-glass preparations and by culture.

So great a number of autopsy reports of the condition of the middle ear in true diphtheria has never before been published. In their arrangement we have followed the plan of Rudolf and Bezold, the first cases being those in which the duration of the disease was the shortest, hence the most severe.

CASE I.—Hedwig M., aged nine months.

Diagnosis.—Laryngo-tracheal diphtheria.

Left Temporal Bone.—Acute otitis media purulenta. Pharyngeal tonsil moderately swollen and intensely red, as was also the mouth of the tube. Drumhead gray, lustreless, with macerated and partially detached epidermis. No perforation. Mucosa of bony portion of tube, tegmen tympani, and drumhead slightly thickened, œdematous, and injected. All spaces filled with thick pus. Cartilaginous tube pale, contains a little bloody mucus.

CASE 2.—Anna M., aged eighteen months. Admitted May 31st.

Diagnosis.—Pharyngeal diphtheria. Croup. Broncho-pneumonia. Nephritis. Small spot of flaky exudate in right tonsil (Löffler bacillus). Respiration 84, with evidences of stenosis. Tracheotomy the same day. Death June 3d.

Left Temporal Bone.—Otitis media purulenta acuta, non-perforans. Mucous membrane of antrum and tympanum intensely red and moderately swollen. Cartilaginous tube unchanged as low down as the pharyngeal orifice.

Microscopic Examination.—Pus from the tympanum showed numerous diplococci in the capsules, occasional chains of streptococci, and pus corpuscles.

CASE 3.—Karl J., aged three years.

Diagnosis.—Diphtheria of fauces and larynx (tracheotomy).

Left Temporal Bone.—Otitis media catarrhalis subacuta. Mucosa of pharynx greatly swollen. No diphtheritic membrane. Drumhead normal. Cavities of the middle ear free from secretion and without a trace of diphtheritic exudate. Diffuse redness of mucosa without swelling. Malleus and incus injected.

CASE 4.—Paul W., aged two years.

Diagnosis.—Diphtheritic laryngitis.

Left Temporal Bone.—Otitis media catarrhalis acuta. Mucosa of nasal cavities slightly swollen, covered with tenacious mucus with here and there slightly adherent fibrinous masses reaching as far as the opening of the tube, but not extending into it. Tympanum filled with tenacious mucus, antrum and aditus empty. The cartilaginous tube pale and coated with a small amount of mucus. No membrane.

CASE 6.—Sophie W., three years old.

Diagnosis.—Septic diphtheria of nares and fauces.

Left Temporal Bone.—Hemorrhagic otitis media catarrhalis. Hemorrhagic inflammation of sphenoid sinus. Opening of tube not clearly recognizable owing to greatly enlarged pharyngeal

tonsil. Right cavity of sphenoid empty, slightly injected; left, contents bloody, with lumps of mucus. Drumhead unchanged. Upper half of bony as well as of cartilaginous tube, tympanum, and antrum but slightly injected. The mucous membrane shows with magnifying glass numerous ecchymoses.

CASE 7.—Hans W., aged twenty months.

Diagnosis.—Diphtheria of the fauces, larynx, and trachea. Grayish-white membrane adherent to tonsils. Klebs-Löffler bacillus.

Left Temporal Bone.—Otitis media diphtheritica catarrhal., inflammation of sphenoid sinus. Entire nasal cavity and pharyngeal tonsil covered with diphtheritic deposit. Tubal opening and promontory pale. Drumhead transparent. Tympanic mucosa pale. The cell above and anterior to the tendon of the tensor tympani shows diffuse redness, marked swelling, and is filled with a fatty, light-gray, croupous membrane. Sphenoid cavity very small and without demonstrable diphtheritic exudate.

CASE 22.—Johann Th., aged three and one half years.

Diagnosis.—Croup. Diphtheria of fauces.

Left Temporal Bone.—Normal in every respect. The pharyngeal tonsil, which is slightly hypertrophic, shows neither redness nor change in epithelial covering.

CASE 24.—Lydia H., aged eight months.

Diagnosis.—Diphtheria of fauces and larynx. Posterior wall of pharynx, uvula, and left tonsil coated with a thick membrane, in which Klebs-Löffler bacilli were demonstrated.

Left Temporal Bone.—Otitis media diphtheritica; pharyngeal tonsil slightly enlarged, but no evidence of diphtheritic membrane. Tympanum and antrum filled with thick pus. Diphtheritic membrane found in lateral and posterior cells of antrum only. Cartilaginous portion of Eustachian tube normal.

(Of the twenty-five reports the greater portion has been omitted owing to lack of space and to the fact that all valuable features are discussed in what here follows.—Tr.)

From the preceding, it is seen that disease of the organ of hearing, and particularly of the middle ear, occurs with uncommon frequency in true diphtheria. We may therefore almost establish the rule that otitis media *forms part of the clinical fiction of diphtheritic inflammation of respiratory tract.*

Among all the autopsies, but 1, case 22, showed a normal condition of the middle ear, while, in the remaining 24, all gave indications of participation of the ear in the general disease. The exceptions to the rule, therefore, are but 4%.

With reference to clinical observation, it is to be noted that the disease of the ear was rarely diagnosed *intra vitam*. Many explanations are to be given for this. Above all, it is to be observed that the onset of the ear disease was, as a rule, free from pronounced symptoms. In none of the cases was there a perforation of the drumhead through which the purulent discharge might have attracted the attention of the clinician. In addition, almost all the patients were so young that they could not have made known the disturbances in the ear.

An examination of the drumhead also could have given but little information relative to the condition of the middle ear, as it was remarkable how slight the affection of this membrane was. On 68% injection was totally absent.

Assembling the results of the autopsies in these 25 cases, we have the following:

1. In 1 case (4%) the middle ear was absolutely normal. It is noteworthy, first, that the interval between the commencement of the disease and its termination in death was so long (18 days); and, second, that the pharynx was free from membrane.

2. In 2 cases (8%) there was catarrhal closure of the tube, and in 1 of them catarrhal and hemorrhagic inflammation of the sphenoid sinus.

3. In 5 cases there was otitis media catarrhalis acuta, more or less severe, and without exudation. In 2 of these, in addition, a catarrhal and hemorrhagic inflammation of the sphenoid sinus, and in 1 a diphtheritic inflammation, as shown by the presence of a membrane.

4. Otitis media catarrhalis acuta, with non-purulent secretion occurred in 4 cases (16%).

5. In more than half the cases (52%) the contents of the tympanum were purulent. In 2 of this number a diphtheritic membrane was also present. These, therefore, should be classed as cases of otitis media diphtheritica. Microscopic

examination of case 2 revealed diplococci having capsules (a double pneumonia existed). In the other cases a bacteriological examination of the pus was unfortunately omitted.

6. Diphtheritic disease of the middle ear was demonstrated in 2 perforations (8%). The membrane was not examined histologically (Weigert's fibrin stain) nor bacteriologically. It showed, however, the character of true diphtheritic exudate, fatty, white, and adherent to the mucous membrane. Both presented the evidence of acute purulent inflammation.

The condition of the cartilaginous portion of the tube has an important bearing on the etiology of the affection of the middle ear. It is generally assumed (as shown by a glance at the literature on the subject) that acute otitis media in diphtheria of the pharynx is a process due to extension per continuitatem, and that the tube forms the path by which extension takes place.

In 21 of all our cases (84%), the interior mucous lining of the cartilaginous tube was normal. It is to be noted that occasionally the lumen contained some mucus though the membrane was normal. It is fair to presume that this mucus was not the product of inflammation, but that it was aspirated into the tube at the time of death. In the other 4 cases (16%) the cartilaginous tube was inflamed.

Case 12 is of particular interest, as here a diphtheritic exudate existed on the promontory of the tube. In spite of this, the middle ear showed no evidences of inflammation. The cases show *that participation on the part of the tube in the inflammatory processes is rare, and that, even though inflammation exist at each end, the middle of the tube remains unchanged.*

Under these circumstances it appears to be highly improbable that the process in the middle ear is simply an extension from the pharynx by way of the tube. On the contrary, it is much more plausible to assume that the disease in question is an affection of the bony cavities of the middle ear accompanying diphtheria, and that the identical relations exist which Bezold demonstrated in his researches in other infectious diseases. Comparing the changes in the middle ear in diphtheria with those found

- * in other infectious diseases the following points are noteworthy :

In contrast to the views generally held, these processes usually pursue a mild and not a severe course, as Bezold found to be the case after measles. From his reports of autopsies which were critically studied by Rudolf,¹ it is shown that otitis following measles only exceptionally led to spontaneous perforation at the height of the general disease. In two cases, 12.5 %, a perforation was demonstrated on the post-mortem table. In the first of these, the findings indicated that it was due to a chronic inflammation existing prior to the general disease. In the second, in which an oblong perforation was found, a paracentesis had been made. In general, however, the process was of a more severe form in those cases of measles than in ours of diphtheria.

In typhoid, and particularly in scarlatina, the condition is usually a severe one. In the six autopsy reports published by Bezold² in reference to disease of the ear in typhoid, otitis media catarrhalis was found once, while in all the others the affection was a suppurative one, accompanied by perforation of the drumhead. It should be observed, however, that these cases were particularly severe, and had exhibited during life symptoms of ear disease. The same author has published, as a further contribution, in a short notice of the results of a number of dissections of temporal bones from typhoid cases which during life had presented no symptoms referable to the ears. Comparing them with our reports, we find that scarcely half presented any change in the condition of the middle ear, and in only 12½ % was there any suppuration. In all probability, therefore, otitis in diphtheria is a more severe complication than when it occurs during typhoid.

Scarlatinal otitis is generally recognized as more severe, and its destructive action is plainly evident from the work

¹ Rudolf und Bezold, "18 Sectionsberichte über das Gehörorgan bei Masern," *Zeitschrift für Ohrenheilkunde*, 1896.

² "Über die Erkrankung des Gehörorgans bei Ileo-typhus," *Archiv für Ohrenheilkunde*, Bd. xxi.

of Burckhard-Merian.¹ This author had at his disposal eighty-five cases of ear disease following scarlatina. Of these 36 % showed acute middle-ear inflammation without perforation, 40 % with perforation, and 24 % with destruction of the drumhead.

We believe in this contribution to our knowledge of the findings in the middle ear in diphtheria that we have substantiated a fact which has not generally been appreciated, namely, *that these affections in the great majority of cases do not represent a genuine disease, but occur as one of the symptoms of a general infection.*

As an appendix, the findings in the sphenoid cavity may be summarized as follows :

In one case (4 %) no change was to be recognized. In three (12 %) the sinus showed moderate swelling and redness of the mucosa. Three times (12 %) it contained fluid but not of a purulent character. In one of these a croupous membrane was present. Three times (12 %) the contents were purulent. In the remainder of the reports no mention is made of the condition, probably as it was not developed.

¹ Burckhardt-Merian, " Ueber den Scharlach in seinen Beziehungen zum Gehörorgan," *Sammlung klinischer Vorträge*, von B. Volkmann, No. 182.

A NEW METHOD OF TREATING [BY DIGESTIVE FERMENTS] DEAFNESS DUE TO THE SEQUELS OF CATARRHAL AND SUPPURATIVE INFLAMMATIONS OF THE TYMPANUM.

BY DR. COHEN-KYSPER, HAMBURG.

Translated by Dr. A. B. KIBBE, Seattle, Washington.

THE pathological changes which, in chronic catarrh of the tympanum, may lead to permanent hardness of hearing frequently consist of a hyperplasia of the mucosa, due to epithelial deposits and proliferation of connective tissue, through which the functions of the ossicles are restricted. Analogous to catarrhal affections of other mucous membranes, this may terminate in a degenerative stage leading to shrinking, hardening, and thickening. A condition frequently found is one marked by the formation of bands and membranes due to adhesions between portions of the hyperplastic membrane in the narrow spaces of the middle ear. This form of chronic catarrh, one of the most common forms of incurable deafness, is designated as dry catarrh, otitis media adhesiva and frequently as sclerosis.

In recovery from chronic suppuration, among other causes of impaired hearing, the formation of cicatricial tissue adhesions etc., are frequent.

I have attempted to affect these usually irreparable processes by introducing into the middle ear solutions of ferments having the power to dissolve albumen, for the purpose of inducing a process of digestion of the hyperplastic material as well as of the connective-tissue products; to dis-

solve them or lessen their size and thereby render the conduction of sound more easy.

That organized tissue *in vivo* is capable of being digested is sufficiently well known. I may here call attention only to the experiments in which rabbits' ears and frogs' legs were introduced into dogs' stomachs through gastric fistulæ and completely dissolved. With reference to the particular form of tissue elements which here come under consideration, it has been demonstrated that the various forms of epithelium as well as connective and elastic tissue may be dissolved by digestive solutions, particularly of pepsin

For such experiments the conditions in the middle ear appeared particularly favorable. First, we have a cavity for the most part surrounded by rigid walls in which the fluid is placed and in which it may exert its action for a long time. If it were merely possible to obtain a superficial action and only dissolve the small particles of tissue, we might think that even this would be of importance in improving the action of the sound-conducting apparatus. Further, the defective processes of circulation and nutrition which exist in the diseases in question predispose the bands, adhesions, etc., to solution by pepsin solutions. The theories relative to the production of the circular gastric ulcer assume such conditions, *i. e.*, disturbances of circulation in individual vascular areas that cause auto-digestion, while the normal mucosa is protected by the alkalinity of the blood.

I have carried on these experiments for nearly four years, in all directions and with a large amount of material at my command. At the outset there were many difficulties to be overcome, from the clinical side of the procedure as well as in reference to the choice and proportion of a thoroughly suitable solution, as our knowledge of these bodies is as yet defective, and for the purpose a series of difficult theoretic experiments was necessary.

Various ferments were tested. For example I worked one entire year with the vegetable ferment papayotin. Finally a definite and completely satisfactory solution for injection resulted from the work of Klug, of Budapest, "Experiments on Pepsin Digestion," which appeared in January of 1895.¹

¹ *Pflüger's Archiv f. Phys.*, 1895, Bd. lx.

He discovered a method, as simple as it was exact, of measuring by photometry the energy of digestive ferments and of making exact estimates of the concentration of the pepsin and of the hydrochloric acid and the difference in the pepsin from different animals. He found that the gastric juice of the carnivorous dog far exceeded in intensity as well as rapidity of digestive power that of the herbivorous cattle and the omnivorous swine. Pepsin from the dog acts so rapidly that in from twenty to forty minutes peptone could be demonstrated in the solution, while pepsin from the other two sources required four hours for the same. This astonishing rapidity of action also showed itself in clinical application. In certain cases when suppuration had ceased, in which the solution came in contact solely with cicatricial tissue, the patients frequently stated within ten minutes that their hearing was better and that they had a feeling as though a veil had been lifted from the ear. Objectively I could also demonstrate an increase in the hearing distance.

With reference to the concentration of the solution, Klug found that, contrary to previous assumptions, the best action was found in a very small percentage of pepsin, and for dog's pepsin in the proportion of 1 to 10,000, in which strength I use it. With reference to its preparation in a suitable solution, everything necessary can be obtained from Klug's article. I may only add that the solution must be *chemically pure* and previously passed through a bacteria filter. The percentage of hydrochloric acid should not be .6%, which Klug found to be the best for digestion. Empirically I arrived at a concentration of .15%.

With reference to the mode of injection, I was first obliged to make each experiment on the cadaver. The always uncertain method by way of the tube was at the outset excluded, as it was not solely necessary for the solution to reach the middle ear, as with other medicaments which are occasionally used, but that a minimum amount should be brought as exactly as possible in contact with the articulations of the ossicles. Experiments in this direction were made on one hundred and fifty cadavers, which by the courtesy of Dr. Simonds were placed at my disposal. Fluid gelatine was in-

jected into the tympanum, allowed to solidify, and the dissection then made in order to determine the action of each method of injection. In this way the desired information was obtained relative to the most suitable method of operation, the proper amount of solution, and the correct position of the patient.

I believed originally that it was necessary to submerge the sound-conducting apparatus as deeply as possible under the fluid, also those parts lying in the upper tympanic space, the bulk of the hammer and of the incus, and had found a suitable procedure, preliminary notice of which I have already published.¹

If the injection be a simple one, made through the drum-head with the ordinary injection needle, the tympanum will in general be only so far filled with the fluid as lies within the area of the drumhead. The entire upper portion of the cavity will remain free. Of the ossicles, only the area of the stapes will be touched. But as this portion of the sound-conducting apparatus is the one which plays the principal rôle in the foregoing diseases, one might restrict himself to this alone if it replaces all other complicated and difficult procedures. The injection is to be made as near as possible to the stapes—that is, posterior to the manubrium mallei, in the vicinity of its upper half, or between the rim of the drumhead and the descending limb of the incus, if this can be seen through the membrane and there is sufficient space to make the puncture.

I have sufficiently satisfied myself that in this way the niche of the fenestra ovalis with the stapes will always and with certainty be filled by the injection. As a rule, the connection between the stapes and incus is covered by the fluid, and often the tendon of the tensor tympani is reached. If the drumhead is strongly retracted and the posterior fold prominent, one may make the puncture at this latter point or use a needle with an anterior curve. It not rarely occurs that the pressure of the injection opens the Eustachian tube and a portion of the solution escapes into the throat. In

¹ *Münch. med. Wochenschr.*, 1893, No. 34.

spite of this, however, according to observations on the cadaver, the spaces in the region of the stapes retain a sufficient quantity owing to their capillary character and this even when the tympanum is quite empty. Plugging the Eustachian tube with a bougie is therefore unnecessary. Lately I have tried the plan of making a counter opening above the injection puncture to give exit to air and superfluous fluid. In cases of adhesion of the drumhead or narrowing of the tube, this is of course superfluous.

The amount of injected fluid, according to experiments on the cadaver, which is sufficient to cover the stapes is from *one half to one decigramme*. As a larger quantity may act more intensely and our purpose be achieved with more certainty, I inject from two to three decigrammes according to the size of the drumhead. Larger amounts are unnecessary, and on account of the danger of too great an irritation are to be avoided. It is of course advisable to warm the solution, taking care to avoid too high a temperature for fear of destroying the pepsin. The position of the patient should be that which is most convenient for the physician, —the head on a low pillow and turned to the opposite side. After the injection, the patient should remain in this position about an hour.

The instrument employed is a Koch syringe modified to meet the requirements of ear instruments. The canula is bent at an angle, the needle toward the point as thin as possible, the bevel short; a piece of rubber tubing between the bulb and glass cylinder is indispensable to steady and safe handling. The bulb should be compressed by an assistant, who should watch the flow of the solution in order that the air following does not drive the fluid out of the tympanum.

Although simply an injection, the procedure is always delicate, often fairly difficult. It is of prime importance that a first injection be successful, as in case of failure a repetition cannot be made at once owing to the danger of excessive irritation. It should not be done, in my opinion, before the lapse of several months. Hemorrhage is to be prevented, for fear of neutralizing the gastric juice (pepsin?

—Tr.). On this account, the descending strip of cutis from the upper wall of the meatus, which carries the large vessels, should be avoided. The use of an anæsthetic is often advisable as the pain is frequently quite severe.

The procedure in cases where suppuration has ceased and a perforation exists is usually very simple. Here I have confined my attention to the stapedial connections, and in individual cases adapted the treatment to them. In complete absence of the drumhead, or when there is a large perforation, it is sufficient to use a few drops, enough to fill the cavity. A plug of cotton is then placed in the meatus to prevent the dissipation of heat, and the patient maintains the recumbent position for about an hour. The same procedure is adopted in total adhesion of the drumhead when puncture and injection are impossible. When the perforation is too small or unfavorably situated, one may use a blunt canula with a bent tip, or puncture back of the hammer.

In the cases with large perforations following cessation of suppuration, one may frequently draw fairly accurate conclusions relative to the mode of action of the pepsin solution. Particularly suitable are cases in which the solution comes in contact with cicatricial tissue, when the stapes is embedded in a cicatricial membrane and the mucosa completely covered with epidermis. Here all associated action may be excluded; the conditions being precisely similar to those in which digestive experiments are carried on in the incubator.

It is unquestionable, therefore, from these cases, *that an actual digestion of cicatricial tissue takes place*. It is scarcely possible to explain in any other way the fact that in such cases immediately after the end of the procedure the hearing improves fivefold, and, above all, remains there. Within one half to one hour all the result possible is usually reached. From this it is apparent that what interferes with the conduction of sound must doubtless be very small particles of tissue. In a few cases in which the injection was made through the intact drumhead the puncture was converted into a small round hole.

In more than half the cases of chronic catarrh, the course

is almost free from reaction, as far at least as findings on the drumhead are concerned, indicating that pepsin solutions as used do not in general produce any extensive irritation. In cases giving the best results, nothing is to be seen on the day following the injection except a slight congestion of the drumhead around the point of puncture. This may persist for a few days. Usually the improvement in the hearing is perceptible on the following day, and at the same time a lessening of subjective noises occurs, if any be present. In the balance of the cases, the appearances of an acute irritation of the drumhead develop, the traces of which are usually still to be seen from one to two weeks. In spite of this the results may be observed as early as the day following the injection, particularly subjectively, and develop further in the next few days with the decrease in the symptoms of irritation. Frequently improvement first manifests itself at the end of about a week. In a few cases two or three weeks passed. Among these were such as showed no symptoms of reaction. Occasionally a decrease in hearing power occurs, lasting usually a few days, rarely more than a week, but which in no way impairs the prognosis with reference to a definite result. From all this it is apparent that the course is throughout an irregular one. In general we may say that the improvement will be the more marked the earlier it appears, and that the chances are more unfavorable the later it is in showing itself.

As an evidence of irritative action, one symptom should be noted. It frequently happens a short time after an injection that a serous exudate into the tympanum occurs, as shown by its flowing into the external meatus. Following an injection of pepsin solution, this exudate is always slight. After the use of papayotin, however, it is much more copious, the meatus often being filled and the cotton used for plugging saturated. Here we are concerned less with an inflammatory exudate than with a transudation. It is to be presumed that this discharge occurs more frequently than is directly perceptible. It is probable that it often remains in the drum cavity, not flowing out of the puncture.

In injections of pepsin solutions, the exudate being of alkaline reaction neutralizes the weak hydrochloric acid, and exhibits further irritation. In this is found an explanation of the assumption that only the superficial particles of tissue are dissolved.

After-treatment is unnecessary if no reactive symptoms develop. Should such symptoms appear, they may be rapidly relieved by the cautious use of the catheter.

In cases in which suppuration has ceased, reaction occasionally recurs if the mucosa is not completely coated with epidermis; in no case lasting more than fourteen days, however.

Of the manifold pathological processes in these affections of the tympanum which come under consideration, we are concerned solely with hypertrophic processes and connective-tissue formations particularly in the niches of the fenestræ and with the stapedia connections. As far as the solutions for injection are capable of acting and, as we have seen, they only attack superficial layers of tissue, a result is possible. All other causes of impaired hearing are excluded, as well as similar processes in the upper spaces of the tympanum, and all those severe and extensive pathological changes, particularly the manifold varieties of bone disease, chalky deposits, ankylosis of the articulations, etc.; above all, co-existing labyrinthine disease. *The treatment is only indicated in cases in which whispered speech is still heard near the ear.* In this degree of deafness, when existing in both ears, the patients state that the conversation of one person can be heard if it is plainly spoken, and not too low, while they are completely excluded from understanding that of a number. The treatment should only be adopted when the effects of the catheter have been exhausted or it has been found to be useless.

A total of 150 cases of such forms of chronic catarrh were treated, of which 40 were bi-lateral. Eighty cases were treated with injections of pepsin solutions. In the remainder, other forms of ferments were used. The number improved was more than two thirds of the total number treated.

This includes the cases in which both ears were affected,

and in which but one was improved. It is noteworthy that the same result was obtained in a large number of experiments with other ferments, particularly with papayotin applied in various ways (45 cases), and with various solutions of pepsin from the pig (about 20 cases). The results were always improvement in about two thirds of the cases.

Following the classification of the individual forms of chronic catarrh, according to Walb,¹ we have, as cases suitable for treatment, first, that of hypertrophic catarrh, characterized by loss of transparency, thickening, grayish-white discoloration, and, generally, retraction of the drumhead. Next, those forms which are to be looked upon as the last stage of simple chronic catarrh, marked by pronounced retraction of the drumhead, with prominent posterior fold, frequently partial atrophy and thinning of the same, and adhesions to adjacent inner parts. That affection for which the term sclerosis is reserved, in a clinical sense, is to be excluded. As is well known, the views of authorities are divided at the present time as well relative to the inclusion of this disease among the catarrhal affections of the middle ear as to its clinical limitations. Generally, they are to be summed up by those in which a pronounced progressive tendency to deafness exists with negative finding on the drumhead, or to those which show hyperæmia of the promontory visible through the membrana tympani. Anatomically, an isolated ankylosis of the stapes may be assumed, which is to be looked upon, according to Politzer's recent examinations, as a consequence of primary disease of the bony labyrinthine capsule. Further, those forms are to be included which plainly bear the character of a primary atrophy of the mucous membrane, as shown by the presence of the same process in the naso-pharyngeal space.

In contrast to this, it was shown throughout that the cases which offered the greatest prospect of success were those in which a permanent improvement in hearing followed the use of the catheter, or the removal of hyperplastic material from the naso-pharynx. Of twenty such patients,

¹ Krankheiten der Paukenhöhle und der Tuba Eustac. Schwartz's *Handb. der Ohrenheilk.*, Bd. ii.

all were improved by injection. When the results of previous treatment were not particularly brilliant, those produced by the injections were, as a rule, more marked both subjectively and objectively.

The degree of improvement in hearing is, in general, estimated by the extent to which it was impaired; that is, it is the more marked the better it was preserved. In general, the improvement was decidedly regular, being about twice to three times the hearing distance for whispered speech.

The value of the procedure is increased by the improvement in subjective noises and other nervous disturbances. In these cases the treatment acts in the same sense as on the deafness. If this was improved, those diminished or disappeared entirely. It several times happened that the hearing remained unchanged, while the subjective noises continued, and *vice versa*.

Observations on the duration of improvement, as far as it was possible to make these on cases in part from dispensary practice, showed, in general, favorable results. In keeping with the character of the affections, observations, extending over a period of from two to three years, showed, now and then, that the improvement was partially or totally lost. The course was, however, always retarded. In several, hearing in the operated ear remained stationary, while in the other it decreased.

Forty-five cases in which suppuration had ceased were treated, of which two thirds were benefited. Here too the improvement amounted to an increase of from twice to three times the previous hearing distance. The results were always permanent.

In concluding, I must emphasize the fact that this procedure is still a therapeutic experiment. In individual cases a successful result may be promised with a certain amount of probability, but the prognosis must always be a reserved one. In cases of chronic catarrh the procedure is often painful, and narcosis frequently necessary. Otherwise, it is free from danger, and beneficial in the majority of cases.

THE HISTORY AND NECROPSY OF A CASE OF FIBRO-SARCOMA OF THE NASO-PHARYNX AND MIDDLE CEREBRAL FOSSA. ASSOCIATED CONDITIONS: ETHMOIDITIS, EMPYEMA OF THE SPHENOID CELL, OTITIS MEDIA, PACHYMEMINGITIS.

By THOMAS HUBBARD, M.D., TOLEDO, O.

(With a figure in the text.)

The complexity of the title is truthfully suggestive of complex pathological conditions, and it is difficult to present them in their proper relation and sequence. The patient, a State official of fifty, was a man of exemplary habits. There was no history of specific taint, and repeated thorough therapeutic tests were made. He was the father of a large family, the youngest being about two and one half years, and all are healthy. He was afflicted with urinary calculi many years ago, and had one attack of peritonitis.

Prior to an attack of the grippe, in April, 1895, he was apparently in excellent health. The symptoms, as described, suggest a general, but not very severe, infection of the ethmoid, and probably sphenoid, cells of the left side, followed by a subacute inflammation of the middle ear, for which he consulted Dr. W. K. Rogers, of Columbus, O., who has kindly given me notes of the case. Evacuation of the tympanum, by paracentesis and catheterization, gave decided temporary relief from the pressure and deafness. Only sero-mucus was found. The pain was referred to the ear at this time. On May 29th he developed paresis of the left external rectus oculi, which subsided in about a month. During the summer the tympanum was repeatedly evacuated for relief of pain and tension, and each time with positive relief. The symptoms of accessory sinus inflammation did not persist beyond the acute stage.

In the fall there was noticed an œdematous swelling in the naso-pharynx above the left Eustachian prominence. This was reduced by operation, and a fragment having been examined microscopically was found to be merely œdematous connective tissue. About this time he first complained of pain in the left parietal region. Dr. E. B. Dench, of New York, was consulted in December, and I am privileged to quote from his notes :

"I first saw the patient on December 8, 1895. At that time he was complaining of severe pain, referred to the left temporal region, tinnitus, and a feeling of fulness in the left ear. Upon otoscopic examination, the left tympanum was seen to contain fluid. The presence of fluid was confirmed by catheter inflation. This latter operation was performed with some difficulty, the rotation of the instrument into the mouth of the tube being apparently impeded by the presence of some foreign body. Upon rhinoscopic examination, the vault of the pharynx was seen to be occupied by a growth, most extensively developed in the region of the left Eustachian orifice, and presenting the general appearance of exceedingly vascular lymphatic tissue. Owing to the age of the patient, the presence of any increased amount of lymphatic tissue in the pharyngeal vault was hardly to be expected. For this reason, I considered the mass of a neoplastic nature. The pressure exerted by the tumor upon the walls of the Eustachian tube seemed sufficient to explain the effusion of fluid into the tympanic cavity. Upon examination of the anterior nares, a few polypi were found in the middle meatus, upon the left side. I immediately removed a fragment of the naso-pharyngeal growth, and placed it in the hands of a pathologist for a microscopical examination. According to this investigation, the tumor was found to be a fibro-lymphoma.

"In the course of a few weeks, the patient returned to his home, and I advised his attending physician to remove the growth from the naso-pharynx. As the microscope had shown that the growth was not malignant, it seemed quite probable that it might be of inflammatory origin. This opinion was strengthened by the condition of the left nasal cavity, the polypoid degeneration of the mucous membrane in the middle meatus being strongly suggestive of an ethmoiditis. This, by extension, might have involved the sphenoid cells, giving rise to the condition of the naso-pharynx already noted. Until the microscopic examination had indicated that the naso-pharyngeal tumor was non-malignant, I believed it

possible that any intra-cranial inflammation present might have been secondary to a malignant growth within the pharyngeal vault. Intra-cranial inflammation seemed also possible, as the result of suppurative inflammation within the ethmoid and sphenoid cells. I was confident that the condition of the middle ear was entirely secondary to the naso-pharyngeal lesion. I was also sure that the severe headache and the pronounced constitutional symptoms, from which the patient was suffering, could depend neither upon the middle-ear inflammation, nor upon the extension of such a process to the intra-cranial structures.

"The suggestions in regard to treatment were carefully followed. The patient obtained no relief,—on the contrary, he became steadily worse."

Dr. Rogers further reports that the head pains gradually extended from the left parietal region to the occipital and later to the left frontal region. He suffered constantly with acute exacerbations of severe lancinating character, but he was attentive to business most of the winter. The right side of the head became equally painful with the left, and he developed considerable rigidity of the post cervical muscles. There was slight febrile reaction at times. During a period he was in Dr. E. J. Wilson's private hospital. The diagnosis of pachymeningitis had been made by Drs. Rogers and Wilson, and mercurials and iodides, with most favorable general conditions, were faithfully tried. There was temporary improvement in the pains and cervical rigidity. The ear continued to annoy him, and there was still some relief following evacuation of the tympanum.

In March, 1896, about one year from the primary sickness, he again consulted Dr. Dench, and I quote further from his notes :

"About three months after my first examination, I saw the patient a second time, and, on account of the severe, persistent headache, suggested the advisability of an exploratory craniotomy. The condition of the left middle ear was essentially the same as at the time of my first examination, fully confirming the opinion that this was a complicating lesion simply. The patient firmly believed that some operation upon the ear itself would relieve the distressing symptoms from which he was suffering. I advised him, however, to have nothing done in this direction, as I was confident that no inflammation of the middle ear could give rise to the symptoms of which he complained."

An exploratory trephining was done by a surgeon in Philadel-

phia. The opening was made at the left temporo-parietal suture, posterior to a vertical line from the external auditory meatus. A wire loop was used to separate the dura, but no indications were found for opening it. He was relieved a week or more from the excruciating pains. During his treatment at St. Joseph's Hospital he once more had a very thorough course of potassium iodide, but in June he returned suffering quite as severely as before. A purulent discharge from the naso-pharynx was noted, and occasionally a sero-mucous discharge from the left ear.

From this time he was under the care of Drs. E. B. and C. M. Harrison, of Napoleon O., who give the history of the development and increase of the focal symptoms. Pain was referred to the whole cranium, and the scalp became exquisitely tender. The stiffness of the neck was constant and very pronounced. The left eye at times protruded from paresis of all its muscles. Vision was much reduced, but the patient was not aware of it until tested. He would lapse into a condition of profound coma, with subnormal temperature and depressed heart action. For days at a time death would seem imminent, and then he would rally, and, after taking nourishment, would present a clear mind and cheerful spirits.

I first saw him in consultation with Drs. Harrison and James Donnelly after he had aroused from an unusually severe period of coma. He was very weak but perfectly rational. Examination was necessarily brief and directed mainly toward ascertaining the condition of the left temporal bone as the possible source of infection, and endeavor to determine the existence of an operable intra-cranial abscess, as these were regarded as the only conditions that could possibly be relieved. There was evidence of congestion of the tympanum and a slight sero-mucous discharge. There was no indication of mastoid disease. Our patient was so thoroughly exhausted that the naso-pharyngeal examination was interrupted, and we went no farther than to determine that there was a small mass of fibro-adenoid tissue and muco-purulent discharge into the throat. The left palato-pharyngeal muscles were paralyzed. At this time the ocular muscles acted normally, but the left pupil was very small and rigid. It should be added that his temperature was never above normal, and usually below. The bowels were very sluggish, and he had occasional attacks of cerebral emesis. There was some

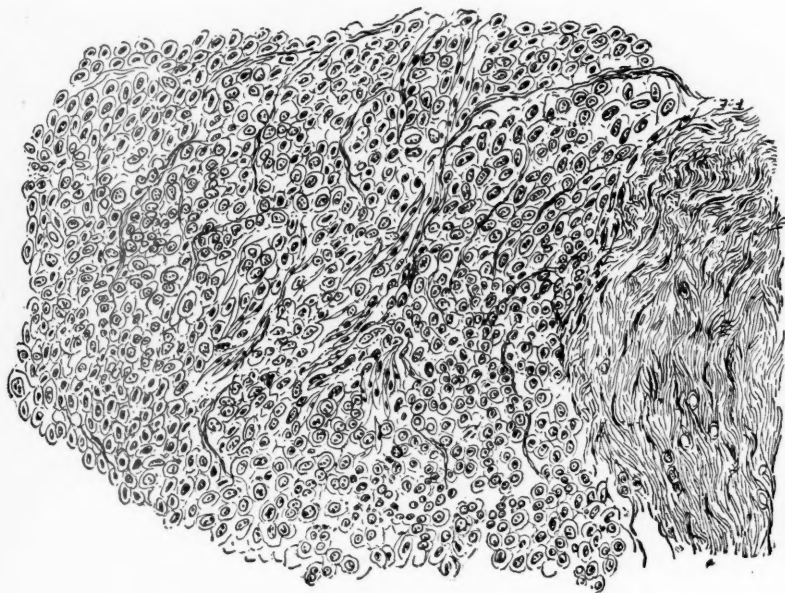
spinal irritation shown by variation in the functions of the bladder, retention and incontinence being noted. The skin became very dry and harsh.

He died October 20th, about a month after our examination, and we were granted a *necropsy*, to be limited to the cranial contents. The trephined area was filled in with dense fibrous tissue continuous with the dura. About one inch posterior there was a bulging ecchymosed nodule about half an inch in diameter. Had the operator trephined over this spot he would possibly have been misled into opening the dura, but we found membranes and brain perfectly normal underneath. There had been pachymeningitis covering an area laterally about one inch either side from the superior longitudinal sinus and antero-posteriorly the middle third of the parietal region. The adhesions between the meninges were quite dense, but no softening or pus was observed. The dura over the temporal bone was perfectly normal except at the apex of the petrous portion, where it was somewhat softened and congested. The substance of the cerebrum and cerebellum was normal. On removing the tegmen tympani we found sanious sero-mucus filling the tympanum and mastoid cells. There was no erosion of the membrane. Flakes of muco-pus were found in the antrum. The bony trabeculae of the cells were soft and spongy, quite in contrast with the firm white tissue of the right mastoid. As the sectioning progressed toward the median line the tissue was found more spongy, and sanious pus exuded. The exact condition of the Eustachian tube was not determined. When the chisel entered the sphenoid cell considerable pus escaped. It had no odor nor was there any erosion of the membrane.

The bony vault of the naso-pharynx having been partially removed we came upon a tumor about the size of an almond. It occupied rather the left vault. Further dissection revealed a similar growth in the left middle cerebral fossa contiguous to the sphenoid cell and extending as far laterally as the foramen ovale. The intra-cranial tumor was firmer and extra-dural, the membrane involved being very red and

softened. The bone contiguous to both masses was very soft and spongy but did not seem to be a part of either growth. The tumor removed was independent of the pituitary body, occupying the sella turcica, but it may have been contiguous to it. The location of the growth readily accounts for the disturbance of the eye functions.

The tumors were sent to Dr. Jonathon Wright, of Brooklyn, for examination. The report is as follows: "Microscopical examination shows it to be made up of small round cells, of small spindle cells, and of fibrous tissue. There are very few blood-vessels. Where they occur their fibrous coats are thickened. The round cells are supported by an intracellular framework of fibrous-tissue stroma. The areas of round cells predominate, but in places the chief characteristic is the spindle-cell formation and in others the dense-fibrous tissue. (See accompanying figure.) Both specimens



show practically the same structure. Diagnosis: "*Small round-celled fibro-sarcoma.*"

In reviewing the history of this case, it is apparent that although there are some points not settled by the necropsy

yet the findings are very instructive. It seems to me that syphilis can be excluded, and I believe that all who treated him concur in this. The question as to the primary source of meningeal infection is important. The location of the meningitis near the superior longitudinal sinus and the absence of temporal meningitis suggest that the ethmoid or sphenoid cells may have been the source. But it is probable that the primary inflammation of these accessory sinuses subsided and that the purulent condition of the sphenoid at the necropsy was due to the neoplasm, since the apex of the temporal bone was in a similar condition. The meningitis was a very confusing factor in the diagnosis.

It is important to note that in centrally located malignant disease of this character, aural or nasal accessory-sinus symptoms may predominate at different stages, and since both of these are operable regions the determination of the primary cause is of great importance. It seems quite clear that the symptoms with the exception of the meningitis can be referred to the neoplasm and hence the conservative management of the case was fortunate for all concerned.

EXTENSIVE, BUT NON-INFECTED THROMBOSIS OF
SEVERAL SINUSES OF THE BRAIN, AND OF THE
JUGULAR VEIN, DUE TO OPERATIVE INJURY OF
THE LATERAL SINUS; RECOVERY.

BY DR. R. HOFFMANN OF DRESDEN.

Translated by Dr. J. A. SPALDING, Portland, Me.

Mrs. B., aged forty, consulted me in April, 1895, for pain in the left ear and left side of her head, which, as she said, began a month ago after an inflammation of the ear following influenza. The treatment, conducted by her local physician, consisting in perforation of the *Mt*, and daily cleansing of the ears, removed for a time the pain, which, however, soon returned, and required repeated perforations of the *Mt*. The day before she consulted me, she had an attack of nausea, which was referred to a gall-stone. She had been sleepless and restless for a month. A year before, she had suffered from otorrhœa in the right side, which lasted for some time, but gradually ceased after using Turkish baths.

The patient is rather anæmic, and holds her head to the left and backward. The *Mt* is pale, and shows a small perforation. There is very little discharge, and the meatus is apparently healthy. There is a suspicion of swelling over the mastoid, and an enlarged gland can be distinctly felt in the inferior maxillary articulation. The tip alone of the mastoid is very sensitive to pressure and percussion.

The functional tests of the left ear showed aërial and bone-perception for watch and fork; low voice close to the ear. Right ear normal.

The ophthalmoscope showed no abnormality in the fundus of the eyes.

Although the suppuration had probably extended beyond the tympanum, I thought it wisest at first to repeat the paracentesis, and to rely on the use of ice-bags, locally, behind the auricle. A free incision was made in the *Mt*, though but little pus escaped, a strip of gauze was inserted, and ice-bags applied.

The patient returned in a week, reporting that although improved at first by the operation, and the ice-bags, the pain was now as intense as ever. Inspection showing the perforation smaller, but no pus, an operation on the mastoid was proposed but declined. The patient was willing, however, to submit to renewed perforation of the *Mt*, and to the use of the ice-bags as before. Furthermore, six leeches were applied, and the perforation in the *Mt* again opened. Between April 19th and 26th ice, leeches, and morphia were resorted to, without avail, the headache, pain in the ear, and in the tip of the mastoid remaining violent.

After renewed examination the patient consented to an operation on the antrum, which was performed April 29th, discovering a small antrum filled with pus and granulations. *On scraping a small granulation in the posterior superior angle of the field of operation, copious hemorrhage from the sinus ensued.* The sinus was tamponed with iodoform gauze.

Much to our surprise, the operation had no effect on the intensity of the pain; on the contrary, it was asserted to be more violent than ever on the following days, and it extended over beyond the middle line to the right side of the head. Moreover, the patient complained of pain in the left side of the neck, along the course of the jugular vein, in the left arm and shoulder, and in the right arm, and added that her legs felt as if they did not belong to her and were weary. She walked, when able to leave her bed, with a shambling gait.

Every inch of the surface of the skull, shoulders, arms, and neck was exquisitely sensitive to the slightest touch, causing her to scream with pain during the examinations.

There was no swelling over the course of the jugular, but the patient suffered from an obstinate constipation, which scarcely yielded to purgatives and clysters.

Ten days after the operation the bandages were renewed, and everything seemed to be following a normal course to recovery, but though there was no swelling over the parts or indication of deep-seated trouble, the headache persisted with all its former in-

tensity. The patient lay abed most of the time, with her head to the left, and when she occasionally sat up, she invariably held her head between her hands. The head could not be turned to either side without calling forth exquisite pain.

A new symptom, in the next few days, of paræsthesia in the right hand, with a sensation of crawling of ants over the skin, induced us to call a consultation with a specialist in nervous diseases, who found nothing to go by except the hyperæsthesia, whilst examination with the ophthalmoscope failed to show any abnormality in the eye as a symptom of cerebral lesions except redness of the right optic papilla, and fulness, with tortuosity of the veins; no œdema of the eyelids.

The pulse varied from hour to hour, sometimes as high as 140° , and then as low as 58° in a minute. The temperature remained normal most of the time.

In the following week a distinct *right-sided* facial paralysis was first observed. The headache was more intense than ever, vertigo was complained of, and then double optic neuritis with retinal hemorrhages were plainly seen with the ophthalmoscope. The right ear was carefully examined to see if from the same any facial paralysis could originate, but it was normal, and the hearing was remarkably acute; tones from 64 vibrations to 40,000 v. being clearly perceived.

About the middle of May, the patient was suddenly attacked with delirium, involuntary evacuation of urine and fæcal matter, and repeated vomiting. The temperature was normal, and the pulse only 50 or 60 beats in the minute.

All of these symptoms, together with constant pain in the head, swelling over the jugular vein, and *crossed facial paralysis*, indicated either a thrombosis or an abscess, and a further operation became an urgent necessity.

An incision ten centimetres long on a level with the upper insertion of the auricle and extending forward over the region of the inferior maxillary articulation, and backward over the junction of the lambdoidal, parietal, and mastoidal sutures, was made under anæsthesia on May 20th. A second incision was then made five centimetres in length, perpendicular to the first, and starting directly over the middle of the auricular insertion. A large piece was then chiselled from the squamous portion of the temporal bone, and the dura uncovered. Next, from six to eight punctures, one of them at least four centimetres deep, were made directly

into the substance of the brain, but no liquid except abundant cerebro-spinal fluid was evacuated. After this negative result the rest of the squamous portion above the upper wall of the auditory meatus and the upper wall of the meatus itself, were chiselled away and the dura removed, but still no pus. Finally, the opening was still farther enlarged, the base of the mastoid and the upper part of the bone chiselled away, and in this way the transverse sinus in a portion of its transverse and ascending course laid bare, as well as a portion of the posterior cranial fossa.

The sinus appeared of a yellow color at the bend, whilst backward it was rather blue. An experimental puncture showed thick, dark blood, and an incision a brownish-red thrombic mass.

The result of the operation at first was excellent, but in a day or two more the patient complained of bodily pain, pulling in the arms, headache, and paræsthesia of the right arm. The pulse was about 100, but temperature normal.

Some days after the operation the patient was more quiet, but on the fifth day began to complain of pain in the right ear extending all over the head and into the neck. The facial paralysis remained about the same as before.

The next set of symptoms, making their appearance about ten days after the operation, consisted of complaints of disturbance in the abdomen. Colic was excruciating, according to the patient's assurances, and the entire abdomen was exceedingly tender to the touch. Oil clysters and laxatives soon relieved these symptoms, but the ophthalmoscope still showed traces of optic neuritis of the descending type, and œdema of the eyelids was very evident.

After a week of comfort the patient began again to complain of pain in the head and operated ear as well as in the neck, which still seemed much swollen over the course of the jugular. The incisions were frequently dressed, and all seemed to be progressing well.

By the middle of June the improvement was again interrupted by complaints of pain, now chiefly in the back, then in the neck, occasionally in the head and neck. The facial paralysis had by this time mostly disappeared, but there were still some disturbances of motion in the right hand. The left pupil was larger than the right, but both reacted equally to the light. The ophthalmoscope revealed a haziness in the margins of both discs, but all

hemorrhagic extravasations had disappeared. The right upper lid still lagged a little behind that of the right eye.

In July, 1895, the optic papillæ remained slightly indistinct, there were no traces of paræsthesia; the incision in the mastoid had healed over; the orifice of the operation was still quite deep, but the patient was discharged. In June, 1896, the patient presented herself, quite recovered.

This paper is already so extended, that a *résumé* may hardly be called for, and yet there are some important points to which attention ought to be called, and that I will now do in as brief a manner as possible. Here, then, was a case of influenza otitis, in which repeated paracenteses of the *Mt*, ice-bags, and leeches failed to bring the expected relief. An operation on the mastoid process becoming an urgent necessity, we opened up cavities filled with, and probably much enlarged by, pus. Now, it seems that, after the infection thus became established in the mastoid, the aditus to the antrum closed, so that the suppuration in the tympanum tended to cease. The repeated paracenteses of the *Mt* temporarily compensated for the closure of the aditus, and thus afforded temporary relief, whilst the rapid closure of the artificial perforations in the *Mt* was followed with rapid recurrence of the unfavorable symptoms.

The morbid process finally extended to the sinus, so that, on removing a granulation in the field of operation, a copious hemorrhage ensued. The pain did not cease after the operation, but additional cerebral symptoms, such as a slow pulse, vertigo, nausea, somnolence, delirium, opposite facial paralysis, and optic neuritis, together with inflammation of the jugular vein, ensued. For these reasons, a second operation became imperative, and, in performing this, we discovered a thrombus in the transverse sinus and jugular vein. The right cavernous sinus was also probably involved, as exemplified by the œdema of the eyelids of the right eye, and the optic papillitis.

Œdema of the lids, as well as optic papillitis, has been observed in a few cases in which the *cavernous sinus* was not involved,¹ but the ophthalmoscopic alterations in our case, with minute hemorrhages in the retina, indicated some obstruction to the circulation in the district of the ophthalmic vein.²

It was impossible to tell whether there was a thrombus in the mastoid emissary also. As the latter connects the sinus with the post-auricular veins, and as there was swelling over the mastoid at the second operation, I agree with Dr. Af Forselles³ that the œdema was rather inflammatory than congestive.

During the operation, the dura was tense, though without visible pulsations, and some cerebro-spinal fluid exuded on making the incision. As the thrombosis extended, the cerebral symptoms increased, but with the unloading of the fluid they gradually diminished.

Amongst the cerebral symptoms I will remark that the headache was exceedingly violent, spreading in every direction down into the neck, shoulders, and arms. The hyperæsthesia of the skin, pain on moving the head, and even after passive motion of the arms, were also marked, but they mostly disappeared after the second operation, though complaints about the condition of the head itself did not cease till the patient's departure from the hospital.

Soon after the second operation *hysteria complicated the case exceedingly*, with a train of symptoms resembling those that had preceded, but now they would come and go with great rapidity, and often change many times in the same day. Another peculiarity consisted in the patient's gait, which can be described by no other word than "shambling." Yet during all the time there were no visible alterations in the skin, or in and about the joints.

It is quite unusual to meet with so severe cerebral symptoms after injury to the sinus, but considering the anatomical relations, and the extensive thrombosis, they are not inexplicable. Moreover, together with the symptoms due to general pressure, we had a *focal symptom* in the shape of crossed facial paralysis, which gave us reason to think that possibly an abscess had associated itself with the thrombus. And since Koerner⁴ has stated that an otitic brain abscess always lies close to bone over the ear affected, the abscess was supposed to lie in the temporal lobe of the brain, and the facial paralysis was referred to the reflex action of the abscess on the internal capsule of the brain.

It may be remarked that abscesses after *acute* aural sup-puration are rare, but they have been observed, as, for instance, in a patient of Bezold's,⁵ who died of otitic cerebral abscess in forty-six days after the beginning of an otorrhœa, whilst Baginsky and Gluck⁶ report distinct cerebral symptoms *twenty-two days* after an otitis excited by the presence of a foreign body in the meatus.

After all is said, however, the operation and the course of our case proved that our idea of a cerebral abscess was erroneous.

The facial paralysis began to disappear with the evacuation of the contents of the calvarium, and finally ceased with the gradual restoration of the circulation. Therefore we must refer the same in some way to the sinus thrombosis, and most probably to some hemorrhage thereby established. And in this we agree with Dusch,⁷ who discovered in half of his cases of marasmic and congestive thrombosis *hemorrhages in the brain or in its enveloping membranes*.

At one time we suspected, also, a peripheral cause for the facial paralysis. A basal affection was to be excluded because such a facial paralysis rarely appears isolated, and some other basal nerves would have been affected. The auditory nerve was normal, there was no middle-ear disease on that side, taste, expectoration, and the velum palati were normal, so that the only further possible exciting cause would have been a lesion of the facial outside of the Fallo-pian canal, and that possibly of a rheumatic origin.

Unfortunately we were unable to carry out the electrical examination which is so important for a differential diagnosis in these affections. And, additionally, in central facial paralysis it is not always the lower portion of the nerve which is alone affected at the start, but the oculo-motor branches also participate in the paralysis.

Furthermore, facial paralysis alone, without some affection of the extremities on the same side, is rarely seen in brain lesions except with limited circumscribed hemorrhages, in which case the general symptoms rapidly disappear, leaving the facial paralysis alone as the last of the hemiplegic symptoms previously present to a greater or less extent.

Or there are on the surface of the brain, or in the course of the medullary fibres passing from the cortex to the centres, *circumscribed and limited disturbances of continuity* upon which the isolated paralyses depend. Therefore, with the brain symptoms in our patient, it was natural to connect the two together. The manner in which the paralysis supervened, and its course after the operation, confirmed this view. For the paralysis came on with the increased cerebral symptoms, and also after distinct circulatory disturbances had been discovered with the ophthalmoscope, then decreased with the diminution in the brain symptoms, and as the ophthalmoscopic appearances approached nearer to the normal conditions.

The facial disturbance being isolated, the hemorrhage which caused it must have been small and not cortical, because the paralysis occurred without irritative symptoms, nor were there later any clonic convulsions.

Nuclear lesions of the facial mostly affect only the lower branch, because the nuclei seem to be separate, though there are exceptions, as noted in Möbius.

Another point to be mentioned was that, in times of joy or pain, the immovable half of the face participated in the mimic movements, as observed particularly by Nothnagel in well-marked facial paralysis of cerebral origin.

The temperature of the patient was almost invariably normal through the entire course of the case, which is in agreement with a non-infected thrombus.

To conclude: This was a case of injury to the transverse sinus followed with extensive thrombosis, with severe consecutive brain symptoms. Such injuries with bad results are rare, or at least but few cases have been reported.* When the injury is slight, and only a small portion of the sinus is laid bare, there is little disturbance in the circulation (Jansen⁹), but where the injury is extensive, and the sinus largely exposed, the thrombus may fill the entire lumen. Jansen has seen several cases, and once on both sides, but no worse symptoms were observed than a slight dizziness on arising from a chair, sensitiveness to pressure in the fossa of the inferior maxillary articulation, and a slight

chill on changing the bandages. Brieger,¹⁰ too, has seen a similar accident, but never associated with serious consequences. In one instance, however, owing to the abundant hemorrhage, the patient became very anæmic, and later suffered from Basedow's disease. Two other cases of my own caused by the sharp spoon recovered without relapse, but a third died, and a small thrombus was found, *though the lumen of the sinus remained patent.*

Knapp¹¹ speaks of one case with a good termination, but mentions, without, however, quoting authorities, that in other instances the result has been fatal. Rheinhardt¹² lost a patient after an endeavor to remove with a forceps a sequestrum lying on the sinus. The latter was ruptured, and the case terminated fatally from infectious thrombosis of the sinus and jugular veins, and subsequent meningitis. Steinbrügge,¹³ Roosa,¹⁴ and Kretschmann¹⁵ also have published similar instances with multiple abscess in the lungs, pyæmia, and exophthalmus, the details of which can be found in the papers referred to in the bibliography appended.

Eulenstein's¹⁶ case is doubtful because it is hard to say whether the sinus was injured by the sharp spoon, or the pyæmic symptoms were due to osteo-phlebitis present before the operation, and from which, as a result of the operation, the thrombus was set free.

Inasmuch as Brieger¹⁷ and others mention that incised wounds in the sinus usually heal without alteration of the passing column of blood, the size and the sort of injury may have some influence on the origin and extension of the thrombus. In our case the dura was not split, but all the punctures into the brain made directly through it. This method has the advantage that, with a negative condition of things in the brain, we avoid infection of the contents of the calvarium with the infected incision of the mastoid process.

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5. BEZOLD, *Archiv f. Ohrenheilk.*, xxi., p. 36, Case 6.
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7. DUSCH, *Henle and Pfeiffer's Zeitsch.*, Series 3, Bd. vii., p. 161.
8. SCHWARTZE, *Handbuch.*, Bd. ii., p. 807, and JACOBY, *Archiv f. Ohrenheilk.*, Bd. xxi., p. 62.
9. JANSEN, *Archiv f. Ohrenheilk.*, xxxv., p. 279.
10. BRIEGER, *THESE ARCHIVES*, xxv., p. 343.
11. KNAPP, *THESE ARCHIVES*, x., p. 369.
12. REINHARDT, *Chirurgische Eröffnung d. Mittelohrräume*, 88.
13. STEINBRÜGGE, *Deutsche med. Wochenschr.*, 1893, p. 432.
14. ROOSA, Reference *Archiv f. Ohrenheilk.*, Bd. xxxv., p. 103.
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16. EULENSTEIN, *Monatssch. f. Ohr.*, 1893, p. 146.
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THE CONDUCTING PORTION OF THE LABYRINTH.

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THE conducting portion of the auditory apparatus is invariably described as ending at the base of the stapes. By conducting is meant that part of the apparatus which mechanically transfers the sound waves to the perceptive portion. The perceptive portion must be limited to the brain and auditory nerve with its terminals. The branches of the auditory nerve end as hair cells inside the various parts of the membranous labyrinth; in the cochlea in connection with the organ of Corti on the membrana basilaris, in the saccule and utricle on the maculæ, and in the ampulla of each semi-circular canal on the crista acoustica. Therefore, before the sound waves can reach the nerve terminals from the base of the stapes they have to pass through the perilymph which fills the space between the osseous and membranous labyrinth, the membranous labyrinth itself, and the endolymph which fills the membranous labyrinth. Under which heading must these be physiologically classed? This also must be the conducting. The sound waves are simply transferred from a solid to a fluid medium. Developmentally this conducting portion of the labyrinth is entirely separate from the true perceptive portion. Therefore the point urged is that the conducting portion does not end at the stapes but *at* the nerve terminals.

If this true physiological division was more insisted upon one cannot help thinking that much light might be thrown

on the physiology of hearing and on the pathology of ear diseases.

It is a suggestive thing to note that, in the saccule, utricle, and semi-circular canals the whole thickness of the membranous labyrinthine wall intervenes between the perilymph and endolymph; whilst in the cochlea the thin delicate membrane of Reissner alone intervenes: this shows that in the cochlea it is necessary that every slightest wave should be transferred to the nerve endings on the membrana basilaris, while in the saccule, utricle, and semi-circular canals such a thing is not so important. In the cochlea, too, in order to prevent too great shocks to the nerve terminals, a special safeguard is present in the scala tympani and the round window with its bulgeable membrane, the sound waves being able to expend themselves.

The perilymph and endolymph apparently must be kept at a certain tension for the proper performance of their conducting function; the former fluid is in communication with the sub-arachnoid space through the aqueductus cochleæ, and the latter with the saccus endolymphaticus, a blind pouch in the dura mater lying against the posterior surface of the petrous bone, by means of the aqueductus vestibuli. It will therefore be seen that the labyrinthine tension is closely connected with the intra-cranial and must alter with it. Here a wide field for speculations and theories is open in connection with this subject. One cannot help being struck by the comparative clinical resemblance of glaucoma to so-called Ménière's disease. May not increased tension of the endolymph or perilymph, due to excessive secretion or obstruction to outflow or any other cause such as hemorrhagic effusion as was found by Ménière in his classical case, be responsible for so-called Ménière's disease or symptoms. Speculation on this theory leads one to imagine that operative interference for the relief of increased labyrinthine tension by puncturing the outer labyrinthine wall may, in the future, be within the realms of practical surgery. It may be said that such theorizing is futile, but the difficulty of carrying out careful pathological examinations in labyrinth diseases is so great, that it is almost justifiable. Other obscure cases

of deafness again may find a pathological solution in diminished tension due to sclerotic or vasomotor changes of the apparatus which secretes the perilymph or endolymph; this is especially so in cases which undoubtedly commence in the middle ear or in which the middle ear first shows signs of being affected, and in which the internal ear subsequently becomes affected, as tested by the tuning-fork. With regard to tuning-fork tests, so far as is known increased bone conduction indicates some affection of the external or middle ear, there being no evidence to show that this test includes the labyrinthine conducting portion. According to the division of the auditory apparatus advocated in this paper, and which I venture to think is the true physiological one, increased bone conduction should be said to indicate trouble in the external or middle ear, and not, as is so often said, of the conducting apparatus.

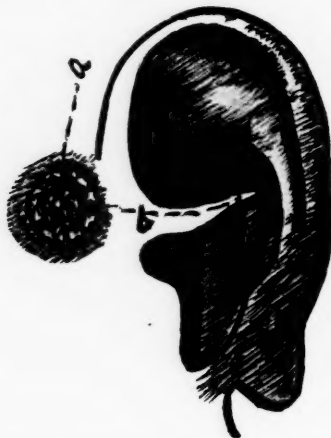
A CASE OF CONGENITAL AURICULAR SINUS
WITH RECURRING INFLAMMATION.
OPERATION. RECOVERY.

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(With a text-figure.)

E. W., aged twenty-three years, female, came to the Royal Ear Hospital in March, 1896, complaining of an ulcer about the size of a sixpence, with an indurated base, situated immediately in front of the auricle at the junction of the helix with the cheek; the history being that a small opening had existed in that situa-



tion all her life, with periodical attacks of inflammation and the formation of an abscess which, on bursting or on being opened, left an ulcer which healed up on simple treatment. Several operations and treatment of different sorts had been tried with no benefit.

A probe was found to pass through an opening at the lower part of the ulcer in various directions : directly inwards, parallel to the meatus for about an inch ; upwards and slightly backwards in front of the helix (*a*) ; and backwards and downwards through the whole length of the crista helicis (*b*).

Under simple treatment the ulcer healed, leaving a small orifice.

In May, 1896, under chloroform, the different divisions were freely laid open ; no distinct lining wall could be found, but anything suspicious was cut away ; pure carbolic acid was freely applied to the whole wound, which was packed with double cyanide gauze and allowed to heal from the bottom. In June it had completely healed. The patient came to report herself in September ; no further trouble had been experienced. The scars lying chiefly in the grooves were scarcely noticeable. A small circular depressed scar was present in the same position on the other side.

SYSTEMATIC REPORT ON THE PROGRESS OF
OTOLOGY IN THE FOURTH QUARTER
OF THE YEAR 1896.

BY DR. ARTHUR HARTMANN.

Translated by Dr. C. ZIMMERMANN, Milwaukee, Wis.

ANATOMY OF THE EAR.

388. WITEBSKY, M. Embryological studies on the sound-conducting apparatus of the axoloths. *Inaugural Dissertation*, Berlin, 1896.

389. RAWITZ, B. Hearing organ and brain of a white dog with blue eyes. *Morphological Investigations of G. Schwalbe*, vol. vi., No. 3.

390. BÜRKNER. On anatomical conditions in microtia and atresia of the auditory canal. *Transactions of the German Otological Society*, Fifth Meeting at Nürnberg, Jena, 1896.

391. GRUBER, Prof., Vienna. A girl, aged six years, with malformation of the auricle. *Monatsschr. f. Ohrenheilk.*, Bd. xxix., Heft $\frac{1}{2}$.

392. BROCA and LENOIR. Remarks on a case of persistent cartilage of Merkel, with absence of the external ear of the same side. *Journal de l'anat. et de physiol.*, xxxii. Year, No. 5.

388. WITEBSKY made further examinations with reference to the statements of Parker, Reichert, and Wiedersheim, according to which the operculum is a detached portion of the labyrinthine capsule. His results were quite different. He found the operculum with the columella to be genetically one formation, originating from the hyaloid arch, *i. e.*, the upper portion of the second branchial arch of the visceral skeleton. KRAUSE.

389. Through Blumenbach and Darwin, we know that cats

and dogs with white hair and blue eyes are deaf. RAWITZ had the good fortune to examine such a case anatomically: A young Dalmatine dog, which had been totally deaf. Semicircular canals normal on both sides. Cochlea greatly diminished in size; the right consisted of 2, left of only $1\frac{1}{2}$ whorls; the cochlea of the normal dog has $2\frac{1}{2}$ whorls. Corti's organ, Reissner's membrane, and stria vascularis are wanting. The basilar membrane, the spiral ligament, and the membrana tectoria are more or less changed. The cells of the spiral ganglion and the fibres of the auditory nerve seem greatly degenerated. The changes on the left side are more marked than on the right. Therefore the left temporal lobe of the brain was smaller than the right. It was hardly one third of the normal size, so that the caudal portion of the gyrus hippocampi lay freely exposed between cerebrum and cerebellum.

KRAUSE.

390. In BÜRKNER's case of lacking external auditory canal, the os tympanicum, the former annulus tympanicus, was totally wanting. Besides, there were various changes in the tympanic cavity. Normal labyrinth.

KRAUSE.

391. Girl aged six years. Left auricle in general normal. Right side of face markedly smaller than left. Roof of mouth very concave. Oral fissure drawn to the right. The right auricle consists of a roundish flap of skin with broad insertion, which must be considered as an excessive lobulus. An oblong prominence supported by cartilage is found above it. Mastoid process at its normal place. No trace of an external ear opening can be found. Catheterism of tube can easily be performed. Nothing definite can be made out in regard to the condition of the middle ear. Hearing of the left ear normal, of the right impaired.

KRAUSE.

392. A child aged three months. Slight abnormalities of right auricle; middle ear normal. The left external meatus is missing; the auricle is replaced by two or three small prominences of the skin. The muscles of this side of the face are greatly diminished. In the interior of the mandibula, the cartilage of Merkel is preserved. The Eustachian tube is preserved, and leads into a cavity closed on all sides, the rudimentary tympanic cavity, in which rudimentary ossicles are found. The hammer is in connection with the cartilage of Merkel and the ligamentum stylohyoideum. The anvil is greatly reduced in size. The internal ear shows normal conditions. From these changes it appears

very probable that hammer and anvil originate from the first pharyngeal arches.

KRAUSE.

ANATOMY OF THE NOSE.

393. SEYDEL, O. On the nasal cavities and the organ of Jacobson in land and mud turtles. *Festschrift zum siebenzigsten Gebruststag von Carl Gegenbaur*, Bd. ii., Leipzig, 1896.

394. TIEMANN, H. On the formation of the primitive choanæ in mammals. *Verhandlungen der physikalisch-medicinischen Gesellschaft zu Würzburg*, N. F., Bd. xxx.

395. BERGEAT, H. The asymmetry of the osseous choanæ. *Archiv für Laryngologie u. Rhinologie*, Bd. iv., Heft 3.

393. Only the following chief points of the voluminous work may be mentioned: The nasal cavity of the land turtles is similar to that of the lower amphibia. It consists of the pars olfactoria, which corresponds to the nasal cavity proper of the amphibia, and the pars respiratoria with the organ of Jacobson. In mud turtles the organ of Jacobson is highly developed; the entire pars respiratoria is covered with neuro-epithelium. Two glands, the external and medial nasal gland, are in connection with the nasal cavity. The peripheral olfactory organ of land turtles has a more primitive structure than that of the mud turtles.

KRAUSE.

394. TIEMANN's article confirms the views held by HOCHSTETTER and KEIBEL, that the formation of the primitive choana is secondary. At first it is a cul-de-sac, formed by the contact of the medial and lateral nasal processes. In front the mesoderma grows between the united epithelial surfaces, behind remains an epithelial bridge, the membrana bucco-nasalis, which breaks, later on furnishing a communicating opening, as primitive choana, between nasal cavity and the primitive oral cavity. The supramaxillary process does not take part in the formation of the primitive nasal cavity.

KRAUSE.

395. BERGEAT reports his investigations on over 100 skulls of animals, and about 1200 human skulls. Asymmetry of the choanæ is very frequent in the anthropomorphous, as Bergeat found in all the skulls that he examined. In man, a distinction must be made between the asymmetry of the arrangement of the choanæ in proportion to the whole skeleton and the asymmetry between the choanæ themselves. According to TOEROCK, 50 per

cent. of all skulls are asymmetrical. Bergeat rates the frequency of asymmetries of the right choana at about 10 per cent. The most frequent and characteristic type is that one pterygoid process is located more downward and outward than the other. More rarely this inclination outwards is limited to the basal portion. The asymmetry due to inclination of the pterygoid process inwards is very rare. The asymmetries seem to be congenital only in rare cases, in most they are acquired. In regard to etiology the author mentions the following points: 1. Unequal mechanical and static influences on insufficiently consolidated bones of the skull; 2. Primary irregularities of the circumference of the choanæ; 3. Secondary displacements of the sphenoid bone and vomer from asymmetrical growth of the skull; and 4. Anthropological influences—*e. g.*, in 5 out of 6 skulls of Abyssinians and natives of Upper Egypt, the right choana was elongated upwards, without other displacements of cranial bones. KRAUSE.

PHYSIOLOGY OF THE EAR.

396. DENNERT, H. On the perception of noises. *Arch. f. Ohrenheilk.*, Bd. xli., p. 109.

397. LUZATTI. The hearing field in space; contribution to the physiology of the hearing organ. *Ann. des mal. de l'oreille, du larynx*, etc., 1896, 12.

396. DENNERT reached the conclusion, from former investigations, that sounds and noises are perceived by the same nervous apparatus. This view, which probably is in accordance with the opinion of most physiologists, he wants to confirm again by the following experiment: If a thin wooden rod, which is held between the teeth, is stroked at its free end, a tone is perceived, which increases in height, if the rod is pushed farther into the mouth. Finally a uniform high-pitched noise is heard. This is produced by the same source and in the same manner as the tone. The point of transition of the latter into the former lies in different persons at different places of the uppermost portion of the scale. As to the influence of the quantity of sound on the hearing sensations, D. emphasizes, that in the unit of time a larger quantity of higher tones comes into play, since the number of oscillations is greater. BLOCH (Freiburg).

397. LUZATTI attempted, on 40 persons, to establish a hearing field analogous to the normal field of ophthalmologists. The

source of sound, a watch, is placed on a rod rotating in a vertical plane around a centre of rotation, fixed on an adjustable stand. The centre of rotation is brought, at a distance of 40 cm, into the same line with the axis of the auditory canal, and the watch is moved in the eight different meridians towards the centre until it is heard. L. found an ideal hearing field, from the different figures, of irregular form, according to the different hearing distance, which was greatest in the anterior superior meridian. L. attributes some influence to the varied formation of the auricle. He adds a résumé of the hypotheses advanced in regard to it.

ZIMMERMANN.

PHYSIOLOGY OF THE NOSE.

398. ZWAARDEMAKER, Utrecht and REUTER, Ems. Qualitative olfactometry. *Arch. f. Laryng.* iv., 1.

399. GOODALE, J. L. An experimental study of the respiratory functions of the nose. *Boston Med. and Surg. Journal*, Nov. 5-12, 1896.

398. The method of qualitative olfactometry of Z. and R. aims, with simple means, at a rapid diagnosis of anosmia in regard to the different species of substances and a reliable method of examination of those cases in which deviations from the rule have been found. For this purpose it was essential that : 1. The various kinds of odors were classified in a natural system. 2. From each group such substances had to be chosen which could be used in appropriate forms for the olfactometer of Zwaardemaker, *i. e.*, in solid cylinders or impregnated in tubes of clay. 3. To ascertain the olfactometric proportion of the single test substances to each other.

ZARNIKO.

399. GOODALE, I. considers the action of the nasal mucous membrane upon respired air with regard to heat and humidity. He used an apparatus on the principle of the aspiration psychrometer. Goodale tabulated the results as determined by the psychrometer in four tables, comparing the experiment—A with cold dry air, B with cold damp air, C with warm dry air, and D with warm moist air, and giving in each table the temperature, relative humidity, absolute humidity, and calories of air—I. after passing the nasal chambers, II. after normal nasal inspiration and expiration, III. after oral inspiration and expiration, and IV. after nasal inspiration and oral expiration. The last exhibits the greatest

increase of temperature and humidity of expired air. Oral inspiration and oral expiration shows the inferiority of air, while air inspired by nose and expired by mouth, is but slightly inferior in temperature and humidity if temperature is warm, but shows a marked difference if cold. The relative humidity of air after passing the nasal chambers is near the saturation point with reference to its own temperature, but at its final temperature it falls short of it, viz., the nose saturates the inspiratory stream and contributes two-thirds of the total amount of moisture evaporated by the respiratory tract. II. The physiological alterations in intranasal air pressure during respiration. GOODALE measures the pressure with water manometers and finds the proportion of inspiration to expiration 3:2. Since the pathological variations in intranasal air pressure cannot be even approximately determined with the available material, Goodale imitates the phenomena by constructing an apparatus in which the pressure may be regulated, and the effects of anterior and posterior unilateral and bilateral stenosis can be registered. Anterior reduction of pressure of one side results in a gain to the free side, and behind the stenosis the pressure increases. Bilateral anterior obstruction produces increase in the pressure behind it. Posterior obstruction decreases pressure in inspiration and expiration; the latter becomes even negative. The associated structural alterations are thus explained by disuse of the nose; the pressure variations influence their development.

III. The route taken by respired air within the nose runs at first against the cartilaginous septum (except in upturned noses in which it is lower) and then against the anterior end of the middle turbinate. It is ascertained by the inspirations of compound stearate of zinc, which settles upon these parts.

The excellent paper received the Boylston Medical Prize of Harvard College.

M. TOEPLITZ.

GENERAL SUBJECTS.

400. NOLTENIUS, Dr., Bremen. Second annual report of my private clinic for diseases of the larynx, nose, and ear. *Monats. für Ohrenkrankh.*, No. 10, 1896.

401. GRADENIGO, G. Report of the oto-rhino-laryngological clinic at Turin for the years 1895-96. *Arch. ital. di Otol.*, etc., vol. iv., p. 489.

402. RANDALL, B. ALEXANDER. Some observations on objective and subjective tinnitus, aneurismal, anæmic, and muscular. *Trans. Amer. Otol. Soc.*, vol. vi., part iii., 1896.

403. BOTEY. Treatment of vertigo, tinnitus, and some labyrinthine affections with puncture of the labyrinth and following aspiration. *Ann. des mal. de l'oreille du larynx*, etc., No. 12, 1896.

404. HAMON DU FOUGERAY. Remarks on the action of chloroform in very small doses after ethyl bromide, etc. *Ann. des mal. de l'or.*, etc., No. 10, 1896.

405. STOERK, Professor, Vienna. On cocaine anæsthesia. *Wien. med. Woch.*, No. 44, 1896.

406. PHILLIPS, WENDELL C. Remarks upon the causes and prevention of chronic catarrh of the nose and ear. *Am. Medico-Surg. Bulletin*, Oct. 17, 1896.

407. GELLÉ. Peroxide of hydrogen, its combined action as hemostatic and antiseptic. *Rev. hebdom. des mal. de l'oreille*, Nos. 46, 47, 1896.

408. FRANKENBERGER, Dr. O. Adenoid vegetations in deaf-mutes, with remarks on the etiology of deafmutism. *Monatsschrift für Ohrenheilk.*, No. 10, 1896.

400. NOLTENIUS, for some time past, operates on hypertrophic palatine and pharyngeal tonsils only in narcosis. A case of tic convulsif was cured by removal of a piece of the septum, a case of tic douloureux by galvano-caustic treatment of the nose. One of the cases of mastoiditis was primary. In tamponade of the mastoid process Noltenius sews the skin entirely after first widening the meatus by two longitudinal incisions as far as into the concha, leaving a flap between of at least 1 cm wide. The stapes was involuntarily removed in two cases of thorough scraping of the middle ear without following symptoms of vertigo. In three cases extradural abscesses of the middle cranial fossa were found during the operation. KILLIAN (Freiburg).

401. GRADENIGO thinks that the figures representing the frequency of the various forms of diseases do not admit of general conclusions, since they differ when taken in ambulatories from those in clinics. Otitic complications *e. g.* were found in 41 per cent. of the clinical patients, and only in 1½ per cent. of the ambulatory patients. Tables are added showing the frequency of various affections, arranged according to age and sex, and important clinical observations with epicritical remarks. GRADENIGO.

402. RANDALL says that "when one studies the singular variations of this latter structure [bulb of the jugular] often intruding upon the cavity of the tympanum, and sometimes dilating up into contact with the acoustic nerve in the internal auditory meatus, the marvel must be that we can ever be oblivious of its bruit in health." A case reported by the writer was that of a man, forty-five years of age, who complained of distressing tinnitus. He was quite deaf in the right, slightly so in the left, with depressed drumheads and negative Rinne. The noise was generally a harsh blowing, varying at times, relieved occasionally by auto-inflation and increased by effort, by stooping or recumbency on the left side. He had suffered much with headache and severe vertigo. The case was diagnosed as one of aneurismal dilatation at the commencement of the carotid canal. Ligation of the common carotic was advised. Randall believes that the objective tinnitus, so-called muscular form, which is often ascribed to the tensor tympani, and which is synchronous with the spasmodic movement of the soft palate, is surely due to the separation of the moist and sticky surfaces of the collapsed Eustachian tube.

GORHAM BACON.

403. BOTEY found from experiments on animals that the aspiration of perilymph is not dangerous, and carefully studied on the cadaver the method of opening the round window. If the point of the needle enters close to the upper margin of the round window upwards and somewhat inwards, an injury of the membranous labyrinth is not possible. Botey performed the operation three times on the living and minutely describes the preparatory steps, detachment of *Mt*, and the puncture. The first case was rather an experiment on a deaf and blind inmate of an infirmary; the others showed labyrinthine symptoms, suggesting an increased secretion or diminished absorption of perilymph. Very little result. The deafness was not at all changed, but vertigo and nausea were less. Botey purposes further communications in detail, and mentioned the matter only to protect his priority.

ZIMMERMANN.

404. In children up to fifteen years doses of 20 grammes at the highest of ethyl bromide generally suffice for an anæsthesia of from 3 to 4 minutes' duration. HAMON DU FOUGERAY, however, observed unusual excitation in 3 boys (of seven, nine, and ten years of age) out of 300 cases. It subsided readily by dropping 8 to 10 drops of chloroform on the same compress with resulting good anæsthesia.

ZIMMERMANN.

405. STÖRK uses cocaine solutions of 20 per cent. for anaesthesia of the larynx, 5 per cent. for the nose. In one case of hypertrophy of the inferior turbinated body a 5 per cent. solution of cocaine, brushed in small quantity on the mucous membrane, produced violent symptoms of intoxication, viz., epileptiform convulsions.

POLLAK.

406. PHILLIPS advises that at the very outset of an attack of any one of the exanthemata, the nose and naso-pharynx should be frequently and thoroughly cleansed. A spray with warm antiseptic saline solutions, alternating with a free use of medicated oily sprays containing, if necessary, suitable germicides, will usually be sufficient. Climate undoubtedly plays an important part in the causation as well as the presence of adenoid growths, enlarged tonsils, and disease of the nasal passages. The writer does not ordinarily advise operations upon the nose in the case of children, relying mostly on the persistent use of cleansing and astringent solutions.

GORHAM BACON.

407. An enthusiastic recommendation of peroxide of hydrogen on account of its styptic (?) and antiseptic actions, with detailed remarks on its indication and mode of application.

ZIMMERMANN.

408. Fifty-nine per cent. of 158 deaf-mutes had hypertrophy of the pharyngeal tonsil (leaving out cases of moderate swelling). Forty-two cases showed purulent otitis media or its residuals. Thirty-seven of them had adenoid vegetations. According to FRANKENBERGER, these vegetations rather promote affections of the hearing organs during infectious diseases, as their fissures furnish a good soil for pathogenic micro-organisms, and, as lymphatic apparatus, "are apt to convey morbid agents into the deeper portions of the temporal bone." In 64 cases of the author, deafmutism was acquired, not congenital. The post-mortem examinations of deaf-mutes so far published generally showed inflammations of the middle ear or its residuals, with changes of the labyrinth. The middle ear alone was diseased only in a few cases. The labyrinth affections of deaf-mutes are much more frequently due to inflammations than to malformations, and mostly acquired after birth even in many cases which were considered congenital.

KILLIAN.

INSTRUMENTS AND METHODS OF EXAMINATION.

409. JANKAU, Munich. The double massage, a new method of treatment of some ear diseases; an otiatric instrument case. *Deutsch. med. Wochenschr.*, No. 46, 1896.

410. DAAE, HANS, Christiania. An apparatus for syringing the nose. *Arch. f. Laryngol.*, iv., 1.

411. DIONISIO, J. On the employment of acetylene-light in medicine. *Gazetta med. di Torino*, No. 14, 1896.

412. BLAKE, CLARENCE J. The use of the drill in mastoid operations. *Trans. Amer. Otol. Soc.*, vol. vi., part iii., 1896.

413. INGALS, E. FLETCHER. Portable compressed air apparatus and nasal saw. *Four. Amer. Med. Assoc.*, Oct. 3, 1896.

409. JANKAU devised a case of otiatric instruments (made by Stiefenhofer, Munich, for \$5), chiefly for the use of the general practitioner, in which he thinks the latter will find every instrument he may need in aural practice.

NOLTENIUS.

410. In the University Policlinic of Christiania, frequently cases of otitis media due to the employment of nasal douches were observed, although correctly used. To avoid this, DAAE now uses as nozzle a Nélaton catheter, without an eye, but perforated as far as 8 cm from the point. After that only one aural affection occurred in about 5,000 irrigations.

ZARNIKO.

411. DIONISIO describes the application of acetylene-light placed on a concave mirror with head-band. The flame is enclosed in a double mantle of aluminium.

GRADENIGO.

412. BLAKE exhibited a drill which he had used continuously for the past fifteen years, consisting of a long, broad-bladed instrument, cutting at an obtuse angle, rotated with one hand and held firmly with the other at a point so near the blade that a very slight deviation of the operative end is represented by a wide and easily appreciable movement of the handle. This instrument is used to make the preliminary opening in the cortex, to be subsequently enlarged by the chisel, and for penetration through a sclerosed mastoid process to the antrum or its contiguous pneumatic cells.

GORHAM BACON.

413. The apparatus consists of a cylinder 8 inches in length and $3\frac{1}{2}$ inches in diameter, the head of which, containing spray tube, bicycle pump, etc., is drawn out and fastened.

The nasal saw, with adjustable handle for different angles, is provided with forward and backward cutting blades, and is made entirely of metal.

M. TOEPLITZ.

EXTERNAL EAR.

414. WEBSTER, GEO A. Othæmatoma, with report of a case *Boston Med. and Surg. Journal*, Oct. 8, 1896.

415. MORSELLI, E. The oldest description of hæmatoma. *Bollet. delle mal. dell' orecchio*, etc., p. 61, 1896.
416. MAX, EMMANUEL, Vienna. Contribution to the casuistics of defects of the auricle. *Wien. med. Wochenschr.*, No. 46 1896.
417. SCHEPPEGRELL, WILLIAM. Keloid tumors of the external ear. *N. Y. Med. Journal*, Oct. 17, 1896.
418. SOMERS, LEWIS S. Aural herpes. *American Medico-Surg. Bulletin*, Oct. 31, 1896.
419. COLLES, C. J. Rupture of the drumhead of the ear from violent aërial concussion ; with a report of two cases. *American Medico-Surg. Bulletin*, Dec. 5, 1896,
420. OSTMANN, Prof., Marburg. Injury of the right ear by stabbing. *Deutsche med. Woch.*, No. 46, 1896.
421. BRAISLIN, WILLIAM C. A case of living maggots in the ear without previous suppuration. *These ARCHIVES*, German edition, xxix., p. 370.
422. HARTMANN, ARTHUR, Berlin. On hyperostosis of the external meatus. *These ARCHIVES*, German edition, xxx., p. 48.
423. VAN ARSDALE, W. W. Plastic operations on the ear. (Section on Surgery, New York Academy of Medicine.) *Amer. Medico-Surg. Bulletin*, Dec. 5, 1896.
424. ANDERSON, WM. Cases illustrating the technique of the plastic surgery of the face. *Lancet*, Oct. 31, 1896.
425. FINNEY, LAWRENCE. Rhinoplastic surgery after lupus. *Brit. Med. Jour.*, Dec. 5, 1896.
414. The case reported was that of a man forty years of age, who had a swelling on the left auricle, the size of a hazel-nut on the upper anterior surface of the auricle, involving the helix, the fossa of the helix, and the antihelix. The cause of the tumor was unknown. When incised, some sanguinolent fluid escaped. A further incision was then carried along the line of the fossa of the helix anteriorly, evacuating the fluid. The cartilage was found smooth and yellow. An incision was then made through the cartilage and skin to the posterior surface of the auricle. The anterior incision was saturated and healed by first intention. The posterior one was packed with gauze and dressed daily for about a week when it healed. The auricle at that time was slightly thickened, but this disappeared later.

GORHAM BACON.

417. Keloid, according to SCHEPPEGRELL, occurs more frequently in the negro than in the white race, and is not due so much to the size or nature of the rings worn in the ear, as stated by some authorities, but to the inherent tendency of this race to the formation of fibroid tumors. He further says that the tendency to recur is very great. Of 14 cases which he has seen, 2 were white patients, 10 negroes, and only 2 mulattoes. His practice has been to carefully dissect out the tumor, after anæsthetizing the part by injecting 5 to 10 minims of a 4-per-cent. solution of cocaine hydrochlorate, and close the wound entirely, if necessary, by a plastic operation, and allow the wound to heal by first intention. In 10 cases of operation by this method, recurrence took place in only 1. The writer gives the notes of 2 of his cases operated upon.

GORHAM BACON.

418. Under the heading of aural herpes, the writer reports a case of a male, sixteen years of age, who, when first seen, complained of an eruption at the orifice of the external auditory canal. One week previously he had an attack of acute coryza, with fever and earache (right side). The neuralgic pain continued for a few days, when an eruption made its appearance on the ear. At that time there were from 12 to 14 small vesicles lying almost wholly within the external meatus. The patients' physical condition was below normal, as he was somewhat nervous and suffered from intestinal atony. Under the use of laxatives and a local application of the yellow oxide of mercury, the subjective symptoms quickly disappeared and the vesicular eruption faded away.

GORHAM BACON.

419. As the result of the premature explosion of a gun, due to a defective firing-pin which fired the charge before the breech-block was locked in its threads, so that the projectile passed out of the muzzle, while the metal cartridge base was blown backward a long distance, two men on the gun platform were killed and four others were hurled to the ground. One of these was blinded by the blast, while another man and the officer in charge sustained aural injuries as follows:

CASE 1.—Lieutenant —, U. S. Army, gave a history of no previous ear trouble. After the explosion he could not hear for some time. There was no pain, but considerable tinnitus. Right canal filled with blood. Ordinary voice heard at a distance of three feet. Watch not heard. A large portion of the anterior and inferior segments of the drumhead had been destroyed. Left

drumhead slightly congested. The hearing eventually became as good as ever, although slight tinnitus remained.

CASE 2.—Private —, U. S. Army. No previous ear trouble. After the explosion he had severe nose-bleed, and felt a tremendous hammering tinnitus in his ears. The ears have been discharging for some weeks. The patient was not seen by the writer until six months after the accident. The left ear was discharging at this time, while the discharge from the right had ceased. Right drumhead showed a small perforation in the upper posterior segment. In the left drumhead there was a large loss of substance in the lower half. Bone-conduction better than aerial conduction. Watch heard at three inches, and ordinary voice understood at about ten feet with both ears. The perforation in the right ear closed and the hearing for the watch increased to ten inches. The perforation in the left ear became smaller and the hearing distance was further improved. GORHAM BACON.

420. The remarkable feature of this case is, that the point of a knife, apparently after a stab, was wedged in the posterior wall of the meatus for twelve years before causing any reaction. The foreign body was removed by operation with recovery from the ear affection. NOLTENIUS.

423. The case was that of an infant, six months of age, who had come under observation four weeks previously. There was a congenital deformity of the ear and one side of the face. The ear was much drawn down and back, and the top was turned forward. The anterior border was first freed. By further plastic work the ear was made to present a fair appearance. As a result, the auditory canal was more open, and cerumen was removed from it. GORHAM BACON.

424. In two cases of re-formation of the nose, ANDERSON adjusted the flaps over a support of coiled silver wire fixed to the body walls. CHEATLE.

425. FINNEY supported the flap, taken from the forehead to restore the nose, on a small sheet of celluloid, such as is used in photography, cut into the desired shape, its edges being made to adhere together by touching them with glacial acetic acid and holding them together in a forceps. CHEATLE.

MIDDLE EAR.

426. SHEPPARD, J. E. An analysis of 114 cases of mastoid involvement, complicating acute middle-ear suppuration. *Trans. Amer. Otol. Soc.*, vol. vi., pt. iii., 1895.

427. JACK, FREDERICK L. Acute suppuration of the middle ear, followed by caries of the Fallopian canal and facial paralysis. No involvement of the mastoid cells. *Ibid.*, vol. vi., pt. iii., 1896.
428. FRIDENBERG, EDWARD. Latent mastoid disease. *Med. News*, Oct. 24, 1896.
429. WALKER, SECKER. A case of extensive necrosis of the temporal bone in a child of three years. *Brit. Med. Journ.*, Oct. 31, 1896.
430. WOLF, OSCAR, Frankfort o. M. Acute otitis media an early symptom of acute rheumatic polyarthritis. *Arch. f. Ohrenheilk.*, Bd. xli., p. 213.
431. GRUNERT. What is to be expected as to the improvement of hearing in ankylosis of the stapes-vestibular joint from the operative removal of the stapes? *Ibid.*, p. 296.
432. SPIRA, R. On a case of latent central otitis of the mastoid process representing the aspect of neuralgia of the fifth nerve. *Ibid.*, p. 123.
433. GURANOWSKI, Dr., Warschau. Casuistics of necrosis of the labyrinth. Exfoliation of the osseous semicircular canals, and the posterior portion of the vestibulum. *Monatsschr. f. Ohrenheilk.*, No. 12, 1896.
434. KIPP, CHARLES J. A case of purulent inflammation of the middle ear, with perforation of mastoid cells, followed by erysipelas (with temperature chart). Recovery. *Trans. Amer. Otol. Soc.*, vol. vi., pt. iii., 1896.
435. TOEPLITZ, MAX. The radical cure of chronic suppurations of the middle ear. *The Post-Graduate*, Nov. 1, 1896.
436. BROCA, A. The intracranial complications of otitis media. *Ann. des mal. de l'oreille*, etc., Nov., 1896.
437. LUC. A case of the Bezold variety of mastoiditis ending fatally; symptoms of cerebral abscess. *Arch. internat. de laryng.*, etc., vol. ix., No. 5.
438. MACEWEN, WILLIAM. Surgery of the brain. *Occidental Med. Times*, Nov., 1896.
439. BACON, GORHAM. A case of brain abscess secondary to chronic suppurative otitis media, and presenting unusual symptoms. Operation. Recovery. *Trans. Amer. Otol. Soc.*, vol. vi., pt. iii., 1896.

440. MYLES, ROBERT C. A case of otitic brain abscess in a child seven years old. Cure. *Ibid.*, vol. vi., pt. iii., 1896.
441. ACLAND, T. D., and BALLANCE, C. A. Cerebellar abscess secondary to ear disease. *St. Thomas's Hospital Reports*, 1894.
442. WALKER, SECKER. Cerebellar abscess complicating mastoid disease. *Brit. Med. Journ.*, Nov. 21, 1896.
443. POOLEY, THOMAS R. A case of otitis media purulenta chronica, mastoid periostitis, mastoiditis interna, abscess of cerebrum, thrombosis of lateral sinus, meningitis, optic neuritis. Death. *Trans. Amer. Otol. Soc.*, vol. vi., pt. iii., 1896.
444. RIDLEY, WALTER. Middle-ear pyæmia. Recovery. *Lancet*, Nov. 28, 1896.
445. STEWART, W. R. H. A case of pyæmia following chronic middle-ear suppuration. Trephining. Recovery. *Ibid.*, Nov. 7, 1896.
446. ADAMS, JOHN L. A case of thrombosis of the lateral sinus, with recovery after operation. *Trans. Amer. Otol. Soc.*, vol. vi., pt. iii., 1896.
447. DENCH, E. B. Thrombosis of the lateral sinus following suppurative otitis media. Operation. Cure. *Ibid.*, vol. vi., pt. iii., 1896.
448. DENCH, E. B. Otitic meningitis. Operation. Cure. *Ibid.*, vol. vi., pt. iii., 1896.
449. KNAPP, HERMAN. A case of acute purulent otitis media in which marked symptoms of meningitis developed. The opening of the mastoid and cranial cavities was followed by prompt improvement and subsequent recovery. *Ibid.*, vol. vi., pt. iii., 1896.
450. RIEHL, DR. CARL, Vienna. Contribution to the casuistics of otogenous meningitis. *Wien. klin. Rundschau*, No. 47, 1896.
451. LANNOIS ET JABOULAY. Hemianopia in otitic cerebral abscess. *Archiv intern. de laryng.*, 1896.
452. SCHWARTZE, H. Otogenous cerebellar abscess. *Archiv. f. Ohrenheilk.*, vol. xli., p. 209.
453. ZAUFAL, Prof., Prague. A case of septic otitic thrombosis of the sinus healed by operation. *Prag. med. Wochenschr.*, No. 49, 1896.
454. RIMINI, E. A case of pyæmia in acute otitis media. *Bolletino delle malattie dell' orecchio*, 1896, p. 161.

455. STERN. Opening of the mastoid process. Phlebitis of the jugular vein; intracranial symptoms of nervous origin. Recovery. *Rev. hebdom. de laryng. d'otol*, No. 50, 1896.

456. JACKSON, HENRY. The treatment of the throat, nose, and ear in scarlet fever. *Archives of Pediatrics*.

457. BISHOP, S. S. The treatment of acute suppurative inflammation of the middle ear. *Med. Mirror*, Sept., 1896.

458. HOOVER, F. PIERCE. Mastoid abscess. History and post-mortem. *The Med. Herald*, Aug., 1896.

426. SHEPPARD draws the following conclusions from the report of his cases: 1. For opening the mastoid the gouge and chisel were used excepting only those cases in which the cortex was so much softened as to make the sharp curette more applicable. 2. For cleaning out the mastoid, sharp curettes were used for the outer, blunt curettes for the deeper, portions. 3. Grippe, outside of the acute affections of the nose and naso-pharynx, due to cold, etc., played the most important rôle in the etiology. 4. The symptoms are important in about the following order: (a) pain, in the mastoid or in some part of the affected half of the head; (b) tenderness, either of the whole, or of some part, of the mastoid (oftenest of the apex); (c) drooping or bulging of the posterior-superior canal wall, especially if close to the membrane; (d) posterior-superior perforation of the membrane, especially if pouting or teat-like; (e) pulsating tinnitus, when it continues as a marked symptom after the time it should have ceased were the case a simple middle-ear inflammation; (f) the external symptoms, redness and œdema of the mastoid, and pushing outward of the auricle. 5. Abortive measures should be employed in a majority of cases for from two to five days, and will, as my cases show, be successful in curing a fair proportion of all cases. Having failed after the judicious use of abortive treatment, to give relief, then I believe the following may be justly given as the remainder of my conclusions: 6. We must time and again operate on the strength of one or two symptoms, and often with even these only slightly marked. 7. If a patient is seen before the external manifestations of mastoiditis have developed, we should never wait for their appearance, because by so doing we give the pus the same opportunity for breaking through the internal, as through the external, mastoid cortex, and while waiting we leave the patient in just so much danger. 8. The operation, if performed with due care, is relatively free from danger. Danger to the patient arises, not from

the operation, but from delay in performing it. Finally (9), my cases make me believe that a pretty safe general rule would be, *when in doubt, operate.*

GORHAM BACON.

427. The case reported by JACK was that of a man, forty-five years of age, who had suffered from pain in the right ear for six weeks. A discharge at first gave temporary relief. The pain returned and at the end of the fifth week complete facial paralysis of the right side of the face developed. The drumhead was perforated and there was some tenderness on pressure just over the antrum and at the tip of the mastoid. The mastoid cells were opened on the following day and found perfectly normal. The opening was extended into the Fallopian canal and softened bone and pus were found, a fine probe passing anteriorly towards the ear and posteriorly behind the inner table of the mastoid. The opening was carefully enlarged in both directions and curetted. "The function of the facial nerve was evidently destroyed." The pain ceased after the operation and the wound healed.

GORHAM BACON.

428. Under this heading, of latent mastoid disease, FRIDENBERG, reports four cases in which it was necessary to open the mastoid cells, and says "that these cases are merely types in which disease of the mastoid, acute or chronic, produces a great destruction within the bone, symptoms not arising until the pathological process approaches or reaches the meninges or the semicircular canals on the one hand or the periosteum on the other—and the lesson which they teach is, that in any case in which purulent discharge from the middle ear continues or extensive carious destruction of the contents and walls of the tympanic cavity exists or has existed at any time, latent mastoid disease should be considered as a possibility and guarded against. GORHAM BACON.

429. Following scarlet fever, WALKER removed a sequestrum consisting of the cochlea, semicircular canals, the internal auditory meatus, and parts of the mastoid cells; a large cavity was left, the posterior and upper walls of which were formed by the dura mater of the middle and posterior fossæ. CHEATLE.

430. 1. A merchant, aged fifty, after acute sero-purulent otitis media, fell ill with severe articular rheumatism with endocarditis ending fatally after $1\frac{1}{2}$ years. 2. A gardener, aged 18 years, four days after commencement of a slight angina was seized with acute catarrhal otitis media (right) and, after another week, with pericarditis and pleurisy of longer duration. In both cases the re-

maining membrane of the tympanic cavity after subsidence of the rheumatism remained thickened (as inferred from the condition of the *Mt*). WOLF considers this as the beginning of sclerosis of rheumatic origin. He thinks that the morbid agent of rheumatism was conveyed to the ear by the blood current, or perhaps *per tubam*, where it becomes primarily localized. BLOCH.

431. GRUNERT's answer is: Nothing, in affections of the labyrinth, nor in many other affections, *e.g.*, of the round window. The effect on tinnitus is also doubtful. The experiments will be continued however. BLOCH.

432. There probably was a subdural abscess after acute otitis media. BLOCH.

433. In a child aged $2\frac{1}{2}$ years, an otorrhœa after scarlet fever had developed, when it was nine months old. From the outset it was complicated with inflammation of the mastoid process. An extensive caries of the petrous bone was followed by sequestration of the osseous semicircular canals and the posterior portion of the vestibulum. The sequester was removed by operation.

KILLIAN.

434. The patient of KIPP, a married woman, thirty-seven years of age was first seen in January, 1895. At that time there was purulent inflammation of both middle ears with perforation of the drum-head. She neglected treatment for some time but came back to the Infirmary on March 22d when, in addition to the middle-ear disease, there was a large swelling below the right mastoid process extending down the side of the neck. Skin not red and there was indistinct sense of fluctuation. On making an incision there was found a perforation in the medial side of the mastoid into the digastric fossa and the pus had burrowed down the neck under the deep cervical fascia. In the mastoid process there were found pus and granulations. At the time of the operation, the integument of the auricle was red and had the appearance of erysipelas. On the following day, the temperature suddenly rose to 104.8° F. The erysipelas travelled across the face to the other auricle. The temperature remained high till the seventh day. The erysipelas did not invade the wound. The patient was discharged from the hospital on April 24th. The otorrhœa at that time was still present and she was treated as an out-patient.

GORHAM BACON.

435. TOEPLITZ believes that, in cases of chronic suppuration confined to the attic in which the malleus and incus only are

carious without implication of the bony walls, removal of the ossicles alone will effect a radical cure. A series of operations performed by him, he says, confirms this view. When, however, the caries has implicated the bony walls, principally the posterior or the inner labyrinth wall, which condition may be diagnosticated with the probe; when the discharge remains very offensive, when the pain in the ear and the corresponding side of the head become so persistent as to make the patient's life miserable, then, after all other measures of relief have been exhausted, the radical removal of all diseased portions becomes imperative. The writer recommends Stacke's operation for these cases, and reports that since Feb., 1895, he has operated upon five cases according to this method, two of which are entirely cured. The remaining three cases are still under his care, in two of which he has had to remove the greater portion of the petrous bone piecemeal after persistent treatment with pure acids. He believes they will soon recover.

GORHAM BACON.

436. BROCA corroborates his former opinion by examples. Only in meningitis are operations without avail. Sometimes, however, an operation will be made, since the symptoms are never entirely beyond doubt, and other intracranial complications can never be totally excluded. Broca gives in detail two new cases of his own observation in children (besides those published by him). The first principle must be, if an intracranial complication is suspected, free opening of the tympanic cavity and mastoid process, and hence going deeper without making a second opening. This is particularly essential for the extradural abscess. Broca does not advocate indiscriminate opening of the cranial cavity in healthy bones, but thinks it sufficient to give free access to the antrum in acute cases, in chronic to the antrum and the tympanic cavity, even if indistinct cerebral symptoms should present themselves. If carious bone is found an extradural abscess may be expected. The opening of the extradural abscess is sufficient, which, especially in children, often produces serious symptoms. In sinus thrombosis Broca prefers previous ligation of the jugular vein, with a better prognosis if the case is operated on earlier. The starting-point for the operation is also the antrum. This ought to be the rule in cerebral and cerebellar abscesses, although the access to them may be more narrow and more dangerous. Broca supports his opinion by detailed clinical histories.

ZIMMERMANN.

437. At the operation the whole mastoid process was found to be resolved into a cavity, which was thoroughly scraped. Upon pressure on the infiltration below the mastoid process, pus oozed from a hole in the posterior osseous wall of the cavity. A bent probe was carried from this hole down towards the neck until it was felt through the skin, and the whole bridge of tissue and bone cut on the probe. The large cavity was filled with a tampon. The case was demonstrated before a medical society as one in convalescence, but the patient died after scarcely a month from an intracranial complication, probably cerebral abscess. Unfortunately LUC was not permitted (by the family physician) to perform an operation and afterwards an autopsy.

ZIMMERMAN.

438. MACEWEN, by invitation of the Cooper Medical College, delivered five lectures on the Surgery of the Brain, thus inaugurating the "Lane Course of Lectures."

Lecture one was devoted to a consideration of the anatomy of the brain, in which the lecturer says that "the true form of the brain in relation to its envelopes is best seen in frozen sections. The projection of the cerebellum beyond the foramen magnum, as seen in frozen sections, not only affords the vital centres an amount of protection, but serves to explain the apparent discrepancy in clinical observations of symptoms arising from tumors situated in one or other of the lateral lobes." The writer referred to a case where the patient had had a fall about a week previously, but had not lain down since the injury, as he had a sense of impending death upon assuming the recumbent position. Upon admission to the hospital, he was persuaded to go to bed, and within a short time death followed. This was explained at the autopsy by the pressure of a blood clot on the respiratory centre.

In the *second lecture*, Macewen spoke of localization of the brain, and exhibited a number of frozen pathological sections of the brain, and showed a drawing of one of the earliest tumors of the brain upon which he had operated.

Lecture three was devoted to a consideration of the mode of detection of cerebral and cerebellar tumors and their treatment. He advises that the first point that is essential in looking at any possible case of brain disease is to eliminate all of other sources or symptoms of disease.

Abscess of the brain was the subject of *lectures four and five*. Macewen is of the opinion that abscesses of the brain occur very

frequently, and that often they are not recognized, and that the most frequent way in which they occur is by the pyogenic erosive processes produced in the skull and in the soft tissues which line it, and which therefore by extension penetrate into the brain. He says: "When you have a cerebellar abscess caused by a focus in the middle ear, we find that that abscess is in immediate contiguity with the sinus (lateral); we do not find it occurring in other parts. If, therefore, after opening the middle ear, we find that the erosive process has taken a backward direction, and that it comes in contact with this sinus, and if the symptoms of an abscess have already been noted, then be assured that you can get at that abscess by going around this large blood channel to its posterior surface"; and further, "in every case of cerebellar abscess which I have had, arising from middle-ear disease, this has been the course that it has taken."

The symptoms of abscess are a distinct lowering of the pulse rate and a marked reduction of the temperature. In the early stage, every case will complain of severe pain in the head. The pain in a few days may be less, but at that time there will be noticed a marked slowness in cerebration. Macewen believes that the first thing that should be done in operating is to open the mastoid antrum, and once inside that cavity we have a very good guide for further operations. After the antrum has been opened, a careful examination should be made as to the position of the erosions and the direction of the same. The lecturer uses, for the purpose of removing the outer portions of the bone, a gouge with a large and flattened head which can be held in the palm of the hand. In addition he recommends burrs (made by the S. S. White Company) which are rotated by a surgical engine. He advises against the use of a drainage tube for an abscess cavity. If desirable to irrigate the brain two canulas should be introduced so that the fluid injected through the upper one can escape through the inferior and larger exit.

GORHAM BACON.

439. The case was that of a young man, thirty-two years of age, who had a chronic otorrhœa (left side) of fifteen years' duration as a result of measles. He had complained of some pain in his head and had acted strangely for some little time. On December 5, 1895, he was confined to his room with a temperature of 104° F. He also had an intense headache and earache. He had a convulsion the same day and was unconscious for half an hour afterwards. The auditory canal was filled with granulations and foul-smelling pus.

The patient was etherized, the mastoid cells opened and communication established between the antrum and mastoid opening. The external meatus was thoroughly curetted. The lateral sinus was injured during the operation as it ran out of its usual course and a copious flow of blood followed, but this was controlled by packing. The patient was much relieved by the operation and remained so for two days when, on December 8th, he developed aphasia. On the following day he had a severe chill followed by profuse perspiration and severe headache. Temperature, 104.8° F. Fundus of each eye normal. December 10th.—Patient again etherized and the sinus explored but no clot was found. A button of bone was removed, the centre pin of the trephine being placed at a point two inches above the centre of the external meatus. The dura was found bulging but pulsating. The opening in the bone was considerably enlarged with rongeur forceps. The dura was found thickened over the tympanic roof, and on separating it from the bone, a gush of foul-smelling pus came away. A Y-shaped incision was made in the dura and a large abscess cavity was found in the temporo-sphenoidal lobe, from which an ounce and a half of pus and broken down brain tissue escaped. The abscess cavity was not syringed out but loosely packed with iodoform gauze. There was some fluctuation in the temperature till December 15th, when it became normal. The abscess cavity gradually filled up and the patient made a slow but uninterrupted recovery. The case was reported especially to demonstrate the point that a patient with a cerebral abscess may have chills, high temperature, rapid pulse, and convulsions so that a differential diagnosis between abscess of the brain and lateral sinus thrombosis becomes difficult. GORHAM BACON.

440. The case of MYLES was that of a little girl, seven years of age, who had had scarlet fever and measles three years previously. About that time the right ear began to discharge and continued to do so at intervals ever since. When first seen, the patient was comatose and could not be aroused. The right auricle protruded, there was extensive swelling over the mastoid region, and a purulent discharge from the ear. The mastoid process was opened and the outer wall wholly removed. The bone was found soft and necrotic and filled with granulation tissue and pus. The curette was passed upward into the attic, and, when curetting away some granulations, suddenly slipped into the cranial cavity. A portion of the roof of the attic was removed and a wine-glassful of

pus escaped. About three weeks after the operation a large swelling appeared under the posterior border of the mastoid process and the occipital bone. A large burrowing abscess was found and a counter-opening was made. The patient removed from the city and was not seen by Myles for nearly two years, when she returned, and at that time her physical condition was excellent, appearance robust, and color good. There was still some discharge from the ear. For a year after the operation she was stupid and mentally weak at times, but for the past six or eight months she was bright and active.

GORHAM BACON.

441. A boy, aged 15 years, had measles at the age of six years followed by a right otorrhœa which had continued ever since. Frontal headache and staggering five days before admission. Vertigo, vomiting, nystagmus, and severe occipital headache for four days. A thin pale boy, drowsy; curled up on his left side with general flexion of both limbs; both eyes deviated to the left; nystagmus, pupils normal, signs of early papillitis; no facial paralysis; right arm and both legs evidently weak; right knee-jerk increased. Fœtid pus from right ear. No abnormal signs over mastoid. Temperature subnormal, pulse about 56° . The mastoid process and tympanic antrum thoroughly cleared of pus and granulation tissue. Posterior meatal wall removed. Half an ounce of pus evacuated from right cerebral lobe. Great improvement resulting from the operation. Nine days later symptoms suddenly returned, with some reddish thin discharge on the dressing. A week still later, a collection of blood evacuated from near site of abscess. Recovery.

Besides the case, ACLAND and BALLANCE give an exhaustive account of the subject which should be carefully studied. Special attention is drawn to the paresis of the limbs and increase of the knee-jerk.

CHEATLE.

442. At a meeting of the Leeds and West Riding Medico-Chirurgical Society, Mr. WALKER read notes of the case of a boy, aged fourteen years, who had recovered after evacuation of an abscess in the left cerebellar lobe.

Among the symptoms were, occasional shivering and vomiting with constipation, weakness of arm muscles on both sides, increased knee-jerk on the left side. There was no optic neuritis, or paralysis of the ocular or facial muscles. In syringing out the abscess cavity, Macewen's plan was followed of introducing two different-sized tubes and syringing gently down the smaller one.

CHEATLE.

443. POOLEY reports the case of a lad, twelve years of age, who had suffered for many years from otorrhœa of the left side. When admitted to the hospital, there were all the characteristic symptoms of mastoid disease. Temperature $102\frac{1}{2}^{\circ}$ F., pulse 128. A Wilde's incision was made, which afforded temporary relief for a few days. Six days later, the mastoid cells were opened and foul-smelling pus and carious bone were removed. Lateral sinus exposed during the operation. On the day following, the patient had a severe chill, with a temperature of $104\frac{1}{2}^{\circ}$ F. On July 29th, choked disc on the left side was discovered. An attempt had been made to keep the temperature down by medication and the application of ice. The patient gradually became worse, becoming blind in the right eye on August 20th. There was found on August 22d violent choked disc, with hemorrhages in the left eye. August 23d, motor paralysis of the right side developed.

Patient became comatose and died September 3d.

Autopsy.—Vessels of dura mater intensely engorged and lifted up by purulent collection. On opening the dura, a layer of foul-smelling pus covered the entire left hemisphere. Pia intensely engorged; entire base of frontal lobes bathed in pus. Optic nerves swollen and sheaths distended. A large, capsulated abscess was found in anterior portion of occipital lobe of the left side. Extensive thrombosis of lateral sinus extending to torcular Herophili, with caries of the temporal bone.

GORHAM BACON.

444. At the Northumberland and Durham Medical Society, Mr. RIDLEY showed a young man whose internal jugular vein had been ligatured and skull opened, for high fever and recurrent rigors, during the course of a fœtid middle-ear suppuration. The vein was filled with fœtid clot, as far down in the neck as it was possible to follow it. A subdural abscess was opened, and the sinus, which was found to be only blocked in its mastoid portion, cleared out. Recovery occurred.

CHEATLE.

445. STEWART'S case was that of a boy, aged eleven years, who, for five days before admission to the hospital, had suffered with pain in the right ear, with vomiting and shivering. On admission, temperature 97° , swelling and tenderness behind the ear, and slight swelling of the right optic disc. The antrum was opened, with temporary improvement. Lateral sinus explored and found to contain a healthy clot. Dura mater incised, letting out a large amount of serous fluid. As the rigors still continued

the lateral sinus was slit up, and the clot, which was perfectly sweet, removed. Recovery resulted. CHEATLE.

446. ADAMS reports a case of a young woman, seen March 9, 1896, twenty-four years of age, who five years previously had trouble with her left ear following a cold. Otorrhœa followed, which continued for a year, and ever since she has had tinnitus in the same ear and has been dizzy whenever the least pressure was made on the external auditory canal. Six weeks ago she had another cold, followed by pain in the same ear. The ear commenced to discharge and was syringed with a warm boracic-acid solution. The pain was severe, so that a leech and warm fomentations were applied. A fainting spell occurred and chills developed, with a temperature of 104° F., and vomiting. There was great pain in the ear and frontal portion of the head. She came under Adams's care at this time, and was admitted to the hospital. There was intense pain over the left mastoid; the latter was swollen and very sensitive to pressure, especially at the tip. The swelling extended down the neck, but no cord-like condition of the jugular vein could be discovered. The canal was filled with whitish purulent masses, and the posterior wall was swollen and boggy. The membrana tympani was almost wholly destroyed.

The patient was etherized. A perpendicular linear incision was made, extending from the tip of the mastoid to half an inch above the posterior root of the zygoma. From the upper extremity of this, another incision was carried directly backwards for three-quarters of an inch. The outer bony table of the mastoid was removed. The posterior osseous wall of the external auditory canal, together with the mastoid cells, was found destroyed and the cavity filled with pus and cholesteatomatous material. This was all scraped away with curettes. The sinus was then exposed. Pus was found around it. An exploring needle was introduced in the sinus; the latter was found to contain no blood. A clot was removed from the upper end of the sinus, and a small curette was passed toward the torcular Herophili. The contents below were removed for as great a distance as the curette could be introduced, but no fluid blood could be obtained from this side. The sinus was irrigated with a salt solution and packed with iodoform gauze. For ten days after the operation, the temperature fluctuated more or less, being considerably elevated at times. Pockets of pus in the scalp were found and opened. After that time, the patient improved rapidly, and on May 1st the wound was healed. GORHAM BACON.

447. The case of DENCH was that of a young man, eighteen years of age, who had suffered five years from a suppurative otitis media. He had no further aural symptoms until the present time when he complained of severe pain in the ear, which gradually spread over the mastoid region. He also complained of nausea and vertigo. The ear began to discharge, and five days later he was admitted to the hospital. At that time there was a scanty sero-purulent discharge. There was bulging of the upper portion of the drumhead. There was considerable tenderness on pressure over the mastoid antrum. Temp. 101° F. The drumhead was freely incised and the ice-coil applied. Twelve hours later the patient had a severe rigor, with temperature reaching 105.8° F. There was also severe headache, delirium, and incontinence of urine and fæces. The temperature fell but rose again.

The patient was etherized and a free incision made over the mastoid process, and upon removing the cortex the pneumatic spaces were found filled with foul cheesy matter. The internal table was destroyed and the meninges exposed. The lateral sinus was explored with a needle and found empty. The sinus was opened and a fibrinous clot removed with the curette. The sinus was further incised and followed downward to within about one quarter inch of the bulb of the jugular vein. By making firm pressure on the int. jugular vein in the neck, and by carrying a small curette downward in the direction of the bulb, blood flowed freely. The sinus was then opened up in the other direction towards the torcular and a curette brought away a fibrinous clot, and free hemorrhage ensued. The wound was dressed with iodoform gauze, which was not removed for five days. During this time the temperature did not rise above 99° F. The patient made an excellent recovery.

GORHAM BACON.

448. The history of DENCH's case was as follows: A man, sixty years of age, had suffered twenty years previously from a double suppurative otitis following typhoid fever. Five weeks ago he was seized with severe vertigo and a feeling of fulness in the left side of the head. The disturbance in equilibrium abated somewhat after a short time, but was followed by intense pain in the left ear and left side of the head. During an interval of three weeks the temperature remained normal; it then suddenly began to rise and fluctuated between 102° and 104° F. Under aseptic precautions the cranial cavity was opened, but the mastoid antrum was not entered as a previous otoscopic examination showed no

obstruction to drainage from the external meatus. On opening the skull just above the external auditory canal the meninges were found much congested and there was a free discharge of bloody serum from the epidural space. A probe passed along the tympanic roof showed slight roughness and evacuated still larger quantities of bloody serum. This discharge was very profuse. After this a dural flap was turned down and the cerebral substance explored in several directions by means of a large aspirating needle. No pus was found. The lateral sinus was explored and found normal. After the operation the temperature never rose above 101° F; the headache and dizziness disappeared. The patient left the hospital four weeks later.

GORHAM BACON.

449. The case was that of a healthy woman attacked with follicular tonsillitis and naso-pharyngeal catarrh. Nine days later she had a second attack, more marked than the first, followed by severe pain in the left ear, dizziness, and a temperature of 102° – 104° F. Drumhead bulging and burst on the third day. After the discharge there was relief. Three days later the discharge suddenly ceased and there was more pain and projectile vomiting. This was followed by improvement, and she felt well for nine days when the discharge ceased again. Then pain in the head and ear became intense, and there was dizziness, nausea, vomiting, delirium, apathy, drowsiness, and she answered slowly and incoherently. Temperature 104° F; pulse, which formerly had been slow, was now 140. The mastoid was tender on pressure; the external meatus was narrowed by bulging of its posterior wall; the left optic disc was congested.

The mastoid cells were freely opened, as well as the posterior and middle cranial fossæ, and communication was established between the mastoid antrum and tympanic attic. No pus was found, but extensive destructive osteitis (caries). The operation was followed by prompt improvement, leading in six weeks to perfect recovery. KNAPP says that "the most remarkable incident of the case was the sudden appearance of copious, somewhat offensive, slightly greenish discharge from the mastoid wound, which occurred two days after the operation, and with which the morbid process had exhausted itself." He was satisfied that "the destructive osteitis had transmitted material into the cranial cavity, which, without the vent produced by the opening of the parts involved, would probably have proved fatal through the development of general meningitis."

GORHAM BACON.

450. Post-mortem examination of a patient, who died on the third day of his sickness with the symptoms of acute meningitis. Meningitis at the base and convexity, thrombosis of the sigmoid sinus; tympanic cavity, antrum, and mastoid cells filled with a mass like raspberry jelly; *Mt* atrophic, deeply retracted, not perforated. The bacteriological examination suggested acute infection due to influenza. RIEHL considers it as a hæmatogenous affection, from the clinical picture and the pathological changes of the brain and the temporal bones. POLLAK.

451. A patient who had otorrhœa for twenty-five years, suddenly showed all symptoms of cerebral abscess: vertigo, staggering gait, nausea, dysphasia, violent headache, hemiparesis of right side, without rise of temperature. Signs of sensory aphasia and homonymous hemianopia, with preservation of pupillary reaction, pointed to the seat of the abscess. Wernicke's reflex proved the abscess to be in the occipital lobe, not in the temporal lobe.

In spite of the positive diagnosis two attempts to find the abscess failed, until the pus cavity was reached by a third trial, based on the positive diagnosis. The latter was confirmed by the autopsy. HARTMANN.

452. Chronic offensive purulent otitis media, defect of the posterior half of *Mt*, intermittent headache at occipital region, vomiting, constipation, vertigo after closing the eyes, tendency to fall towards the healthy side, right pupil dilated, patellar reflex increased; low, frequent, and often irregular pulse, sub-normal temperature. Death through paralysis of respiration. Abscess of the right hemisphere of the cerebellum of the size of a walnut, circumscribed lepto-meningitis and internal pachymeningitis, old endocarditis deformans. New formation of connective tissue in the labyrinth. The symptoms of the abscess were headache, vomiting, and the unequal size of the pupils. The heart disease could not be recognized during life. BLOCH.

453. Acute purulent otitis media of right ear with perforation of the anterior-inferior quadrant, fever, no chills, hemicrania, slight drowsiness, stiffness of neck, sluggish reaction of the pupils, no changes of the fundus of the eyes, paralysis of the bladder, retardation of pulse, pain in the right mastoid process, which did not show any changes externally. The operation revealed pus in the deep posterior cells of the mastoid process. Chiselling of the sigmoid sulcus lays bare a perisinuous abscess. Apex removed

by chisel, sinus exposed and opened with the scissors, the lateral wall cut away, the jugular vein ligated in the region of the thyroid cartilage. In the further course metastatic abscesses formed between the glutei muscles of left side, and purulent pleurisy; the former were incised, the latter punctured. Complete recovery within six weeks.

POLLAK.

454. A child, aged seven years, with acute catarrhal inflammation of left ear. Two paracenteses started very moderate mucous discharge. Chills set in with high fever of pyæmic character, and later on pain in right wrist and left knee-joint. Opening of the mastoid did not show anything pathological, but on exposure of the sinus a moderate quantity of pus escaped. Its walls were discolored, no pulsation. After incision small thrombi adherent to the walls were pulled out. No pus in the sinus itself. Pyæmic symptoms persisted even after the operation; metastases in right wrist and left hip-joint, which were operated on. Icterus with decoloration of fæces two days after trephining. Recovery in three months. The case is rare, since it was one of acute otitis which had a benign character from the start.

GRADENIGO.

455. The sinus was not discolored at the time of the operation, and therefore was not opened. Four days after the operation, the jugular vein became painful and its neighborhood infiltrated. On the tenth day, first chill. On the twelfth, incision of the infiltration below the mastoid process without pus being found. On the fourteenth day, second chill, with increased swelling around the jugular vein. On the twenty-seventh day, the infiltration was cut and much pus liberated. After that spontaneous recovery, which soon was interrupted after nervous excitement by symptoms suggesting an intracranial complication. They subsided, however, entirely within the next three weeks under internal treatment.

ZIMMERMANN.

456. JACKSON calls attention to the great importance of carefully examining the nose, throat, and ears during the course of scarlet fever. There are pseudo-membranous lesions of the palate, and this process may spread to the post-pharyngeal wall, and after invasion of the pharyngeal vault, to the nose. This process is usually found on the third or fourth day of the disease and is the direct cause of the most alarming and fatal complications of scarlet fever, namely, septicæmia, otitis media purulenta, and infection of the cervical glands, besides serious

kidney lesions. The writer advises the use of a 4 % boracic acid solution for the mouth and nose, and if the pain is severe Dobell's solution can be used. He recommends the atomizer instead of the nasal douche, and says "it was the experience of the aurist at the City Hospital that when nasal douches were employed as a routine treatment, disease of the ear was much more common than when the nose was not so treated." If the ear becomes affected, he advises that an aurist be called at once, "as an immediate incision of the drum with inflation may in many cases save the patient from weeks of suffering as the result of purulent otitis."

GORHAM BACON.

457. After a very extensive use of aristol in acute suppurative inflammation of the middle ear, BISHOP finds that it is a very light and non-irritating powder, with an inoffensive odor, besides possessing an anæsthetic property to a certain degree.

GORHAM BACON.

458. The patient, a man aged forty-seven, had suffered in the head, especially on the left side, so that he would cry out in agony. On examination there was much tenderness over the mastoid on the left side and left side of the head, the swelling being particularly marked at the posterior and superior border of the mastoid portion. There was marked fluctuation over the left parietal bone. An incision was made, under cocaine, and a large amount of pus evacuated. The following day the patient was etherized and the incision previously made was enlarged, and necrosed bone as well as granulations were removed. The wound was dressed with bichloride solution and iodoform. The patient's temperature remained high, reaching 105° F. The patient's condition gradually became worse, until he became comatose. He died ten days after the operation. A *post-mortem* examination showed that the lateral sinus extending back on the left side to the junction of the superior longitudinal sinus contained a purulent thrombus. The latter extended into the superior petrosal sinus, but the inferior petrosal sinus was normal.

GORHAM BACON.

NERVOUS APPARATUS.

459. POLITZER, A., Vienna. Ménière's disease from traumatic lesion of the labyrinth. *Arch. f. Ohrenheilk.*, Bd. xli., p. 165.

460. ALT, FERDINAND, Dr. On deafness after mumps. *Monatschrift f. Ohrenheilk.*, No. 12, 1896.

461. THOMAS, HENRY M. Alveolar sarcoma of the cerebellum. Clinical report. *Bulletin Johns Hopkins University*, Nov., Dec., 1896.

462. ALDERTON, H. A. The influence of deafness upon the development of the child. *The Medical Standard*, Sept., 1896.

463. GOWERS, W. R. Subjective sensations of sound. *Brit. Med. Journal*, Nov. 14, 1896.

459. A man, aged seventy-one years; fracture of skull with paralysis of right facial and auditory nerves, disturbance of equilibrium, acute purulent otitis media. Death after thirty-nine days from purulent meningitis, bronchitis, and lobular pneumonia. The fracture of the right petrous bone runs through the internal auditory meatus and the cochlea. The latter is filled with reddish-yellow granulations. Analogous lesion on left side, but only the lower whorl of the cochlea contains a reddish fluid. Histologically the cochlea contained an exudation partly consisting of round cells; the endosteum showed inflammatory swelling. The same inflammatory products in the vestibulum, ampullæ, and semicircular canals. The new formation of connective tissue is farther advanced on the left side. In the two former cases described by VOLTOLINI and POLITZER the fractures showed the same direction. They seem to be independent of place and direction of the trauma. This rapid proliferation of connective tissue probably leads to speedy and lasting deafness, also in inflammations of the labyrinth from other causes (with consecutive ossification).

BLOCH.

460. After a careful review over the literature, ALT describes the following case: A girl, aged twelve years, grew completely deaf on both sides on the third day of mumps. After pilocarpine, iodine, and hearing exercises, the deafness subsided so far within three months that she could understand ordinary conversation at a moderate distance.

KILLIAN.

461. The case reported by THOMAS was that of a young lady, aged thirty, who was seen October 17, 1895. She complained of difficulty in walking, of deafness, and difficulty in seeing. She had always been delicate. Three years ago she had very severe headaches, which recurred almost every day until August, 1895, when she received glasses that gave her some relief. She had at times momentary losses of vision, especially of the left eye, but sometimes of both. For about a year she has had difficulty in walking, at times staggering; also a sensation of tingling in the

feet and of numbness in her nose and mouth. Since January, 1895, she has become more or less deaf. When examined, October, 1895, there was a well-marked rotatory nystagmus, which increased in looking toward the left; fields of vision slightly contracted; vision practically normal. An ophthalmic examination showed well-marked neuro-retinitis of both eyes. She was quite deaf in the left ear, not being able to hear the watch. Hearing fairly good in the right ear. When standing with closed eyes, she staggered, and if not steadied would fall to the left. The presence of a brain tumor was suspected, although the possibility was entertained that the case might be one of multiple sclerosis combined with hysterical symptoms. She remained in about the same condition until October 25th, when she fell in the street, after which she was never able to walk again. The headaches then became severe, and the hearing in the right ear was worse and tinnitus developed. Early in December she was unable to hear any sound, either by bone-conduction or any other way. Vision left her finally. She had two or three attacks of vomiting and slight convulsions, and later there occurred a complete right facial paralysis. After these late symptoms developed, Thomas believed that the growth involved the corpora quadrigemina.

In the same number of the *Bulletin*, L. F. Barker published "Remarks on the Anatomical Relations of the Cochlear and Vestibular Nerves."

The post-mortem examination of the above case was made by Dr. Flexner, and the pathological report was as follows: The dura mater was free from adhesion to the calvarium. Internally the dura adhered to a tumor mass which projected on the left side into the inferior fossa of the skull. The tumor measured $6 \times 4 \times 4$ cm and was attached to the median side of the left lateral cerebellar hemisphere, its growth being directed forwards. The tumor had exerted pressure laterally upon the left corpora quadrigemina, the right being but little, if at all, involved in the compression. The tumor had also flattened the left half of the pons almost to the median line. The left crus cerebri was pressed upon, particularly on its superior surface, and the left superior peduncle of the cerebellum partially flattened. The middle and right lobes of the cerebellum were free from the tumor and effects of direct pressure. The growth extended beneath the dura where it covered the petrous portion of the temporal bone. The seventh and eighth nerves on the left side were pressed upon and much

flattened, those of the right side appeared small and atrophied. All the ventricles of the brain were dilated, and contained an excess of clear fluid. From a microscopical examination the diagnosis of alveolar sarcoma was made, and it was believed that the tumor sprang from the cerebellum.

GORHAM BACON.

462. ALDERTON claims that it should be the duty of the local board of education to form a special class in the public schools for the instruction of those handicapped (deaf) children, by teachers trained especially for this purpose. The child with impaired faculties is as much entitled to public instruction as the healthy child; the fact that unusual methods and special teachers are required should be no rightful bar to its claim.

GORHAM BACON.

463. The Bradshaw Lecture delivered by GOWERS before the Royal College of Physicians is a philosophical dissertation, which, although not adding considerably to the knowledge of this difficult subject, furnishes abundant food for thought, and indicates, in a truly scientific manner, the way in which the subject should be considered. Many most interesting cases are related.

CHEATLE.

NOSE AND NASO-PHARYNX.

464. PLUDER, Dr., Hamburg. On rhinitis fibrinosa diphtherica. *Deutsche med. Wochenschrift*, Nos. 44 and 46, 1896.

465. PRICE-BROWN, J. Clergyman's sore throat. *Amer. Medico-Surg. Bullet.*, Oct. 3, 1896.

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468. GUARNACCIA, E. Bacteriological investigations on caseous rhinitis. *Archiv. ital. di Laryng.*, etc., p. 52, 1896.

469. LANTIN, G. On foreign bodies in the upper air passages and four new cases of rhinoliths. (From the Vienna General Polyclinic, department of Prof. Chiari.) *Arch. f. Laryng.*, iv., p. 2.

470. ROCHARD and GOUQUENHEIM. Enormous sequester of the left nasal cavity in syphilis. *Ann. des mal. de l'or. du lar.*, No. 10, 1896.

471. SMITH, J. W. Foreign bodies in various regions. *The Medical Chronicle*, Sept., 1896.
472. MACCOY, ALEX. W. Irruption of teeth into the nasal chambers. *N. Y. Med. Jour.*, Dec 26, 1896.
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475. ARSLAN, Y. Abscess of the nasal septum. *Bollet. delle mal. dell'orecchio*, etc., p. 70, 1896.
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480. RUPP, ADOLPH. Nasal polypus in a female infant four weeks old. *Med. Rec.*, Nov. 14, 1896.
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508. THOMSON, WM. Two cases of spontaneous cure (1), tumor of antrum of Highmore; (2), growth on soft and hard palate. *Brit. Med. Journal*, Nov. 28, 1896.

509. GOULD, PEARCE. A case of tumor of the pharynx. Removal after laryngotomy. Recovery. *Lancet*, Oct. 24, 1896.

510. NEWMAN, DAVID. Epithelioma of the tonsil and left posterior pillar removed by lateral pharyngotomy. *Lancet*, Nov. 28, 1896.

464. PLUDER observed six cases of rhinitis fibrinosa diphtherica, of which five were examined in the bacteriological institute of Hamburg. Loeffler's diphtheria bacilli were found in all. Pluder observed "combination with pharyngeal diphtheria in the same patient, as well as severe and slight diphtheria of the pharynx and diphtheritic angina in persons in contact with the patient," the nasal affection sometimes preceding, sometimes following. Pluder therefore thinks that there is no antagonism between fibrinous rhinitis and diphtheria, and that fibrinous rhinitis is not always to be taken for a harmless affection. There is only one objection to the identification of both diseases, viz., that so far no case of rhinitis fibrinosa has been observed which was followed by a paralysis.

NOLTENIUS.

465. The designation of clergyman's sore throat is obsolete. The large majority of chronic throat disease originate in nasal or naso-pharyngeal obstruction. Follicular pharyngitis, catarrhal and follicular tonsillitis with enlarged and hardened tonsils and hyperæmia of vocal cords constitute the real clergyman's sore throat. In the ten cases reported by PRICE-BROWN, large nasal polypus, dislocated nasal cartilage, twisted uvula, hypertrophy of faucial tonsils, ulcer of hyoid fossa, septal ridge and spurs, posterior septal catarrhal hypertrophy, pharyngitis granular, and turbinal hypertrophy were found.

M. TOEPLITZ.

466. Among the drugs used by SEISS in atrophic rhinitis, thymol

is still considered the best, in watery solution with alcohol and glycerin, or better dissolved in albolene, glymol, or benzoïnol in the proportion of from 3 to 10 grains to the ounce; in combination also with menthol, pine-needle oil, and eucalyptus in the strength of from 1 to 3 per cent. Europhen in ointments or as dusting powder with stearate of zinc or pure is preferable to aristol and iodoform. Cinnamon oil (10 per cent.), added to the ounce of albolene, is applied as antiseptic spray.

M. TOEPLITZ.

467. From a series of practical experiments in the oto-rhinolaryngological clinic at Turin, DE SIMONI confirms the presence of a bacillus in the secretion of ozæna, similar to the diphtheria bacillus, with the qualities described by Belfanti. He values highly the tinction method of Gram-Weigert.

GRADENIGO.

468. GUARNACCIA recapitulates the various opinions of the authors on the so-called caseous rhinitis, and finds that some of them consider the rhinitis as a special form of disease, whereas others take it only for an accompanying affection of different diseases of the nose or its accessory cavities. The microscopical and bacteriological examination of the cheesy matter in his case revealed a special micro-organism, which belongs, according to Professor DE GIASCA, to the species of streptothrix alba in regard to its morphological and cultural qualities. This micro-organism was found in great abundance, and seems to have been overlooked by the authors who have so far studied rhinitis caseosa. It may be considered as the cause of the formation of the specific matter.

GRADENIGO.

469. LANTIN's communications on foreign bodies of the nose, and the 18 cases described contain nothing remarkable. But the exact microscopical and chemical examinations of the dissolved concretions and the nucleus are of interest. The author concludes from his observations that there are no rhinoliths without central foreign body. The numerous bacteria found in each rhinolith have nothing to do with the incrustations of lime, they only furnish passive material. Lantin describes a case of a patient, forty-four years old, who swallowed a needle while eating bread. After one year the broken needle appeared beneath the skin of the neck. An egg shell was lodged in the larynx of a child, one and a half years old, and could only be extracted by tracheotomy.

ZARNIKO.

470. A girl, aged thirty-three years, who acquired syphilis eighteen years previously, noticed suppuration and obstruction of the nose during the past five years. Only the left side was diseased. A sequester of such dimensions was found that, as the temporary detachment of the nose according to ROUGE was not sufficient for its extraction, temporary resection according to OLLIER had to be performed. Behind the first, another sequester, equally large, but more easily movable, was discovered. Both were irregular and black. The exact origin is not stated. The operation did not disclose the origin of the sequester. An examination two months later revealed a perforation in the posterior portion of the septum, and such softness of the middle and lower turbinated bodies that the absence of their bones seemed to be very probable.

ZIMMERMANN.

471. Among the cases related by SMITH is that of a boy who had a slate-pencil driven through the hard palate, the upper end of the pencil projecting into the nose, the lower being flush with the palate. Under anæsthesia, a finger having been placed in the post-nasal space, the pencil was divided by means of a pair of narrow bone forceps in the nose; the remaining portion then pushed into the nose by the end of a drill.

CHEATLE.

472. MACCOY gives a complete bibliography, with full report of all cases, to which he adds two, one observed by Dr. Arthur W. Watson and one of his own observation. Watson's case was a man, aged thirty-three, with nasal sarcoma of the right nostril, in which a root of a tooth was found to be imbedded under the inferior turbinal. MacCoy's patient, a female, aged forty-five, had presented, after birth, a gathering beneath the right orbit, which for several years remained suppurating, with extensive necrosis of the bones of the face, and had healed with a depression. At the time of birth, two teeth were present on the right side of the upper jaw, just behind the usual place of eye-tooth. The primary dentition was normal, all teeth came except one just back of the right eye-tooth. These teeth remained, but were always bad. There was no second dentition. Offensive catarrh of the right nostril, with occasional discharge of small black pieces of bone persisted. In 1884 she felt a loose gritty bone beneath the right orbit, and also a hard substance in the right nostril. In September, 1895, she presented herself with occipital and temporal headache. A tooth was removed from the right nostril, 4 *cm* behind the vestibule, leaving a depression in the

floor. No necrosis was discernible. The tooth was a permanent bicuspid.

M. TOEPLITZ.

473. WATSON excises under cocaine a portion of the cartilage from the protruding part of the septum, without injuring the underlying mucous membrane, straightens the septum with a crushing forceps, and holds the fragments in place by a pin, inserted like that in ROBERTS's operation, as if it would fasten a button-hole bouquet. The operation devised by ASCH, which is now considered the best, is not mentioned in the paper.

TOEPLITZ.

474. BOND removed a soft vascular polypus, about half an inch in diameter, which sprang from the left side of the cartilaginous septum. The patient, a man aged thirty, had had severe bleeding from the left nose.

CHEATLE.

475. ARSLAN briefly mentions the literature on abscess of the nasal septum, and reports 8 observations of his own. In none of his patients a trauma preceded, not even a deformation of the external nose. Only in 2 cases perforation of the septum followed. Nearly all his patients had some nasal trouble: deviation of the septum, hypertrophy of the lower turbinated body, empyema of the antrum of Highmore, naso-pharyngeal catarrh, etc. Such changes apparently predispose the nose to infection.

476. The elaborate article cannot be reported, must be read in the original.

KILLIAN.

477. After an historical review, showing that the trephine (moved by an electro-motor) was much earlier known in America than in Europe, the author recommends the method of ASCH for correction of considerable deviation of the cartilaginous septum (*New York Med. Jour.*, 1890, 20, xii.). Asch incises the septum with a kind of button-hole scissors, makes an incision rectangular to the first over the ridge, forces the fragments through and fixates them by obturators of caoutchouc until they are healed. Narcosis is necessary. Results are excellent.

ZARNIKO.

478. With brief reference to literature, ACERBI describes a tumor which suddenly had sloughed from the nose of a lady with rhinitis caseosa. It chiefly consisted of alveolar connective-tissue. The alveoli were lined with endothelium. The point of origin could not be ascertained.

GRADENIGO.

480. The pedunculated, pinkish tumor found in the left vestibule of a girl, aged four weeks, was attached high up, possibly to the middle turbinated body, and removed with cold snare and ring knife, whereby free respiration was fully established.

481. A man was operated on by BOND for a sarcoma of the nose, the growth having existed for five years. The nose was laid open by an incision along the side at the junction with the cheek, and turned over to the other side. The part of the septum with the growth on it was removed, and the floor down to the bone. The site of growth curetted and burnt with a Paquelin's cautery. No recurrence during five months. CHEATLE.

482. RIPAULT operated from the canine fossa in six cases. To the well known indications he adds the presence of streptococci. He makes an opening of about 1 cm square, irrigates the antrum with a solution of chloride of zinc, scrapes the walls with a sharp spoon, irrigates again all recesses, and introduces a loose (to avoid pain) tampon of iodoform gauze. The tampon is removed after 48 hours, the second tampon remains 4, the third 8 days. As a precaution Ripault recommends drilling the alveolus and introducing a canula for irrigation, in case the large opening should not prove sufficient. The latter did not seem to be sufficient in more than the half of his six cases, thus rendering the term "large opening" rather nugatory. ZIMMERMANN.

483. CASE 1.—Man, æt. twenty-three years. Pain and swelling of the region of the left frontal sinus for 3 years after sea-bathing. Repeated incisions of the soft parts were not sufficient. Operation: A few sequestrs were removed. The frontal sinus contained granulations and offensive pus. Scraping, tamponade. Suture after 24 hours. After about 14 days the wound had to be reopened and thoroughly scraped, and a large opening was made toward the nasal cavity. Recovery.

CASE 2.—Woman, fifty-eight years old. The affection existed for 11 years. Large swelling from left ocular angle of the root of the nose, the skin over it reddened. The frontal sinus was opened from in front; scraping and suture. She died of broncho-pneumonia.

CASE 3.—Man, æt. thirty. Affection for 16 years. Marked exophthalmus, especially in the last few years. Opening of the sinus, which contained a thick yellow fluid. Scraping. Suture. Recovery.

CASE 4.—Man, æt. twenty-one. Affection for 2 years. Diagnosis: Osteoma of the right frontal sinus, starting from its floor. At the operation a tumor was found of eburneous irregular surface, almost filling the left frontal sinus. It was a typical compact osteoma of the size of a hen's egg. GRADENIGO.

484. A woman, æt. twenty-two, had chronic hypertrophic rhinitis and purulent discharge from left nostril for years. Several endonasal operations relieved her only temporarily. Therefore opening of the frontal sinus from outside. It was filled with granulations and pus. As the suppuration persisted, the granulations were again scraped out. The probe penetrated through the carious wall into the cranial cavity. Exposure of the dura mater through a wide opening and puncture of the brain did not reveal any abscess of the brain. After a few weeks the same was repeated but with the same negative result. Hemiparesis of the right limbs, later on also of facial nerve. A last attempt to get it under control by evacuation of the ethmoidal bone failed also. Speedy death. The post-mortem examination showed a large abscess in the left frontal lobe and purulent basilar meningitis. The author surmises that there were at first several small abscesses which later united, making a localization impossible during life.

NOLTENIUS.

485. NAIRNE records three cases of empyema of the frontal sinus: in one, necrosis of the posterior wall existed with a large subdural abscess, empyema of the maxillary antrum being also present: in another, a perforation had formed in the orbital wall, with an abscess in the orbital cavity. Recovery in each case.

CHEATLE.

486. BABER's case was that of a woman, aged fifty-two, who suffered with left frontal pain, foetid discharge from the nostril, and prominence of the left eyeball. The frontal sinus was opened by a trephine and found to contain clear viscid mucus and cholesteroline crystals; the opening in the nose found to be blocked, due in all probability to disease of the ethmoid cells. Communication established with the nose by means of drill and chisel. Suppuration occurring in the sinus, the anterior wall was removed, with the exception of a ridge one-eighth of an inch in height at the lower border; the thickened mucous membrane also cleared away, except that portion overlying a gap in the bony roof of the orbit; the skin and periosteum stitched over, and a drain inserted, healing occurring in about a month.

CHEATLE.

487. At a meeting of the Liverpool Medical Institution THELWALL showed a patient from whom he had removed an ivory exostosis which grew from the inner wall of the frontal sinus, and which protruded slightly into the orbit. The patient, a woman forty-six years of age, had received a blow thirteen

years previously. The tumor was bossed and mammillated, and weighed three quarters of an ounce. CHEATLE.

488. MILBURY principally depends for diagnosis of disease of the antrum of Highmore upon transillumination, and prefers to operate through the anterior wall of the canine fossa, making a large opening with the dental burr and chisel with subsequent insertion of a drainage-tube or gold eyelet. He operates under cocaine or bromide of ethyl. Of the three appended cases the first is of interest as one of cancer of the maxillary antrum.

TOEPLITZ.

489. 1. A turnkey in a police station exhibited a primary intranasal chancre of the vestibule and anterior portion of the lower turbinated body, transmitted by the finger-nail.

2. A multilocular cyst of the posterior end of the left middle turbinated body without relation to ordinary nasal polypi, which recurred within three months after removal. TOEPLITZ.

490. ROE draws from his exhaustive paper the following conclusions :

1. That deviations of the septum are produced by a variety of causes operating upon different persons, and that upon the same person several different influences may be operating at the same time.

2. That heredity plays a very important part as a predisposing cause, not only by the dyscrasias which may be transmitted, but by the blending of different races in the composite type, which brings about an infinite variation in the conformation of the osseous and cartilaginous structures.

3. That the three local causes most frequently producing deviations, spurs, and ridges of the septum are trauma, nasal obstruction, and unequal growth of the different parts of the vomer.

491. Adenoid hypertrophy, if unchecked, does not leave the pharyngeal vault healthy. The remaining conditions are a permanent enlargement or thickening, genuine atrophy, and Tornwaldt's bursitis pharyngea. DELAVAN sums his paper up as follows : These conditions are common, can be traced back to adenoid hypertrophies, result from the effect of long-continued inflammations, and would have been prevented by the removal of the original adenoid enlargement. M. TOEPLITZ.

492. Contrary to the views of De Santi and others, DICKERMANN concludes, from the careful study of the literature which is fully reported in the paper, that papilloma or papillary fibroma of

the nose is rare. It usually develops upon the anterior portion of the septum from a small base, is slow in growth, and generally appears in middle life. It does not ulcerate nor cause infiltration at its base, and is to be considered as a benign growth. Dickermann reports an observation of his own made in a man aged sixty-two. The microscopical examination is illustrated by a photograph.

M. TOEPLITZ.

493. In order to estimate the amount of nasal obstruction, WRIGHT uses a naso-manometer, made on the principle of the Sass spray-tube, which is filled with carmine-stained water and fitted to a millimetre scale registering as high as 150° ; the manometer is connected with a rubber tube by a slender metal tube. On inspiration the column rises from 5 to 15 mm, on forced inspiration from 25 to 40 mm, in atrophic rhinitis from 75 to 90 mm. Errors should be guarded against. The amount of obstruction to the air-current in the naso-pharynx offered by adenoid growths can be ascertained by the stethoscope, placing the mouth of the instrument firmly against the cheek just anterior to the external auditory meatus.

M. TOEPLITZ.

494. Twenty-one different formulæ of Dobell's solution are given by thirty-one authorities. In some the glycerin was omitted. PYNCHON holds that the solution ought not to contain more than one drachm of salt and six ounces of glycerin to the pint. The strength of the carbolic acid must be at least of one per cent. in order to be antiseptic, and, therefore, not be substituted by a milder drug. The solution is to be used in small quantities except in atrophic rhinitis.

M. TOEPLITZ.

495. Ortho-chloro-phenol is more satisfactory than para-chloro-phenol. It is the most powerful astringent, particularly for nasal hypertrophies, also an antiseptic and slightly anæsthetic. In atrophic rhinitis and nasal ulcers a 10 per cent. solution in glycerin is used. BERENS has also tried the drug in furuncles of the ear, suppurative otitis media, and laryngeal tuberculosis with good result.

M. TOEPLITZ.

496. LOEB uses the Aloe converter, which can be applied only to the alternating current. It reduces the voltage of 104 to 1, $1\frac{1}{2}$, 2 . . . or 8 volts, and consists of an iron core with a large primary coil of fine wire and a smaller secondary coil.

M. TOEPLITZ.

497. In this report presented to the laryngological section of the British Medical Association, FRAENKEL concisely summarizes his views, which are probably familiar to the readers of these ARCHIVES. Lacunar angina is an infectious disease. Exposures

(e.g. trauma after nasal operations, colds, coryza, etc.) predispose the organism to it. The infectious germs may also be conveyed to the parenchyma of the tonsils through the lymph current, causing a regular tonsillitis, viz., a profuse emigration of leucocytes.

ZARNIKO.

498. GOUQUENHEIM reports a case of streptococci angina, terminating fatally by pyæmia.

ZIMMERMANN.

499. MEYER found in the lacunæ of healthy tonsils a streptococcus salivæ, similar to streptococcus pyogenes, but not identical with it, and some other cocci, as staphylococcus pyogenes alb. and aureus, and leptothrix. In 14 out of 55 cases of lacunar angina he found the staphylococcus alone, in 24 staphylococcus and streptococcus pyogenes, in 15 the streptococcus pyogenes alone. In 2 cases he found the diphtheria bacillus, once the pseudo-diphtheria bacillus. The author considers the streptococcus pyogenes as the chief agent of lacunar angina. He thinks that the reason why it was not found in the first 14 cases was the unsuitable reaction of the culture soil. Besides the streptococcus, the staphylococcus and pneumococcus may cause the disease, in some cases also the diphtheria bacillus.

ZIMMERMANN.

500. Leptothrix mould was found on the back of the tongue, tonsils, and posterior wall of pharynx. Painting with iodine being without result, COLIN used chloride of iron. The mould turned black within two days and sloughed easily. After three to four paintings fungi could be detected only in the crypts which were difficult to approach. These also disappeared after three weeks of this treatment.

ZIMMERMANN.

501. Difficult respiration, especially at night, in an otherwise healthy child. The soft palate and a small zone of the hard palate, a portion of the tonsils, both palatine pillars, and the lateral walls of the pharynx were coated with dense rose-colored elevations of rather solid consistency, about 1 mm thick and 3 mm long. No ulceration. Naso-pharynx free. The elevations extended on the sides to the larynx down to the false vocal cords (getting thinner and softer), leaving the epiglottis free. This explained the difficult respiration. The suspicion of lues was corroborated by the successful administration of iodine. Improvement after two weeks, complete recovery after four months.

ZIMMERMANN.

502. Elaborate description of two cases of marked tuberculosis of the upper air passages, of which the first represents an affec-

tion of the nose, the naso-pharynx, and oral cavity secondary to phthisis of the lungs and larynx. The other showed an extensive affection of the isthmus faucium and the pharynx, which had to be diagnosed as primary tuberculosis, since there was no other affection to be found.

ZARNIKO.

503. In former cases of phthisis MOURET had observed elevations on the tonsils. He saw the same picture in a cook, aged twenty, who suffered pain in swallowing during the last year. On the two pale tonsils (the whole mucous membrane was pale) were situated two or three flattened elevations, almost as large as a peanut, ending in points. They were removed for histological examination. Besides, there were flat ulcers on the margin of the epiglottis, inflammation of the papillæ, and catarrh of the apices of the lungs. The microscopical examination of the elevations revealed giant cells and tubercle bacilli. Mouret is inclined to think that the tonsils might become the seat of primary tuberculosis, and urges further microscopical investigations.

ZIMMERMANN.

504. In the first case the primary affection settled in the depth of the left tonsil, probably on the floor of a lacuna, and was just struck in resecting the tonsil, which was inflamed and swollen beyond the median line. In the second case an extensive ulcer with a gray coat and surrounded by hard infiltration was found at the lower pole of the tonsil. Mercurial treatment effected a cure in both cases.

ZIMMERMANN.

505. On examining 11 cases of peritonsillar abscesses bacteriologically, LOGUCKI found only in 2 streptococi, in 6 staphylococci, and in 3 both kinds together. From this and the clinical observations he infers: 1. The peritonsillar abscess is a secondary affection, starting from the tonsils and favored by adhesions between tonsils and faucial pillars. 2 The infectious germs emigrate from the tonsillar crypts. 3. The reason for streptococci being in preponderance at the opening of the abscess, and finally becoming less numerous than staphylococci, is probably due to the fact that the staphylococci supplant the streptococci. Hence we can understand that an at first severe process may take a favorable course after the pus is emptied.

ZARNIKO.

506. At the microscopical examination of a number of tonsils, RUGE quite often found peculiar glandular formations in the lacunæ (in 4 out of 25 cases, and in various morbid conditions, viz., in 1 case of severe sepsis with follicular angina, in 2 of simple catarrhal angina, in 1 case of tuberculosis of the tonsils

and pulmonary phthisis). They are radiating fungi, but not identical with the actinomyces of man, on account of certain differences in form, reaction to staining fluids, and pathogenic conditions. The author excludes the possibility of etiological relation between sepsis and the presence of the radiating fungi in 1 case, but he does not doubt that the fungus may produce mycosis of the tonsils and pharynx and tonsillar hypertrophy, eventually also abscess and other affections suggested by the cases of Sabrazès and I. Israel, if the fungi were the same in these. In the cases of the author the radiating fungus was found only in the crypts of the tonsils; the consequences were destruction of the epithelium at different places, and partly reactive changes in the surrounding tissue, *e. g.*, emigration of round cells and infiltration. The white accumulations in the tonsillar crypts described by Chiari and Jacobson are probably identical with the actinomyces-like formations observed by Ruge. HAENEL.

507. STIRLING reports 3 cases of bony growth of the tonsil, the first occurring in a young lady, unilaterally, the second and third bilaterally, in brother and sister of sixty-three and sixty-four years of age respectively. They are felt by the finger as hard, immovable masses, coming from behind the tonsil underneath it forward to the level of the anterior surface, and differing in size in each case. In the first case only some pain occasionally originated from the growth. Stirling considers them simply as prolongations of the posterior limb of the transverse process of the atlas and of the styloid process. Surgical interference is not required. M. TOEPLITZ.

508. In an address, delivered at the Surgical Section of the Royal Academy of Medicine in Ireland, THOMSON related 2 extraordinary cases which had occurred in his practice. 1. A gentleman suffered with a growth in the nose; malignant disease of the antrum was diagnosed, and an exploratory operation was performed. The patient refusing to have the superior maxilla excised, the tumor was removed as far as was possible under the circumstances, and pronounced, by Dr. O'Sullivan, Professor of Pathology in Trinity College, to be a round-celled sarcoma. Recurrence occurred in two months. The patient soon after consented to the more radical operation, which was performed; the tumor was found to occupy the whole antrum, to infiltrate the base of the skull, and to have perforated the septum, passing through to the other side. Signs of return occurred in a month, the tumor bulging through the incision and protruding upon the

face. A further operation was found to be useless. The patient himself applied poultices of comfrey root. In about four months' time the patient came to Thomson, the tumor having completely disappeared from the face, all trace of it gone in the mouth, and no pain of any kind. 2. A gentleman, aged seventy-five years, suffered with sore throat for about two months. The right soft palate and a considerable part of the hard occupied by a malignant-looking, flattened growth, projecting for about an eighth of an inch. An ulcer on the free margin of the palate, extending to the tonsil. A mass of enlarged, fixed, painless glands at angle of jaw. Sanious discharge from nostril. Posterior nares blocked. The structures over the alveolar process of the upper jaw, at the posterior part, infiltrated and resisting. Diagnosis of malignant disease. In two months necrosis set in, and the whole engaged structures sloughed away, leaving a ragged chasm, which granulated and healed. The patient is now alive, aged seventy-nine. CHEATLE.

509. After performing laryngotomy, PEARCE GOULD slit the soft palate and removed a fibroma which was attached to the upper vertebræ and extended to the sphenoidal sinuses. The patient was a man, aged twenty-nine years, who had suffered with nasal obstruction, deafness, loss of flesh, and one attack of epistaxis. CHEATLE.

510. At a meeting of the Glasgow Pathological and Clinical Society, Dr. NEWMAN read the notes of the case; the growth was almost limited to the left tonsil, but involved the anterior part of the posterior faucial pillar; there were no enlarged glands. Lateral pharyngotomy, with division of the inferior maxilla at its angle, was performed. No recurrence seven months after the operation. CHEATLE.

Contents of the last number of the Zeitsch. für Ohrenhk.

Vol. XXX., No. 2. Issued March, 1897.

VI. Anatomical nomenclature, sanctioned by the Commission of the (German) Anatomical Society, introduced and explained by W. HIS. Reviewed by O. KÖRNER.

VII. The position of the consonants. By F. BEZOLD.

VIII. The recognition of the perforations of the *Mt.* By E. BLOCH.

IX. On a case of acute uncrossed disease of the acoustic, facial, and trigeminal nerves. By D. KAUFMANN.

Systematic report on the progress of otology in the fourth quarter of the year 1896. (Translated in the present number.)

Miscellaneous notes.

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